The Crane-Flies of New Caledonia (Diptera Tanyderidae, Tipulidae)

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ABSTRACT

A study of more than 5000 specimens from New Caledonia, deposited in the Auckland Museum, the Bernice P. Bishop Museum, Honolulu, the Muséum National d'Histoire Naturelle, Paris, and the National Museum of Natural History, Washington, provides an annotated list of 89 species in 18 genera and 40 subgenera. Of these species, 15 are described as new and 8 placed in synonomy. The family Tanyderidae, genus *Radinoderus*, is reported for the first time. New records for the family Tipulidae include one species from the subgenus *Rhampholimnobia* of the genus *Helius*, one each from *Amphineurus* and *Cheilotrichia*, and several species from the genus *Limonia*. The genus *Austrolimnophila* has been dropped from the New Caledonia list of genera. Comments on the variation of taxonomic characters, seasonal and geographic distribution, and the general biology of many species are included. A key to the species is provided.

RÉSUMÉ

L'étude de plus de 5000 exemplaires de Nouvelle-Calédonie, déposés à l'Auckland Museum, au Bernice P. Bishop Museum, Honolulu, au Muséum national d'Histoire Naturelle, Paris, et au National Museum of Natural History, Washington, permet d'établir un catalogue annoté de 89 espèces appartenant à 18 genres et 40 sous-genres. Parmi ces espèces, 15 sont décrites comme nouvelles, tandis que 8 sont mises en synonymie. La famille des Tanyderidae est signalée pour la première fois de Nouvelle-Calédonie, avec une espèce nouvelle du genre *Radinoderus*. Les nouveautés sur la famille des Tipulidae comprennent une espèce d'*Helius* du sous-genre *Rhampholimnobia*, une d'*Amphineurus*, une de *Cheilotrichia*, et diverses espèces du genre *Limonia*. Le genre *Austrolimnophila* est rayé du catalogue des Tipulidae de Nouvelle-Calédonie. La variation de certains caractères systématiques, la répartition saisonnière et géographique, et la biologie générale de nombreuses espèces sont commentées. Une clé de toutes les espèces néo-calédoniennes est fournie.

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Source : MNHN, Paris

INTRODUCTION

Those concerned with the biogeography of the South Pacific have found that New Caledonia is important in developing explanations for the distribution of any organisms. This has certainly been true of the Tipulidae. ALEXANDER (1945, 1948a, 1948b) and HOLLOWAY (1979) briefly discussed ideas about how the cranefly fauna came to exist on the island, but their arguments were based on incomplete listings of the genera and species present. The recent availability of a large number of specimens from New Caledonia has provided me the opportunity for a more complete and precise listing of the island's genera and species, thus giving a better basis for such discussions. In my opinion, the same type of work must be done on the islands to the north, extending to Papua New Guinea before confirmation or refutation of these discussions is possible. As a result of this study, I provide here an annotated list of the species, as well as a key to the genera, subgenera, and species of the main island.

C. P. ALEXANDER (1948b) indicated the first specimens (of six species) from New Caledonia were obtained in 1928. At the time of ALEXANDER's publication, the list was approximately 45 species, representing 24 genera and subgenera. Thirty years later, the list had grown to around 80 species. Recently, several hundred specimens were sent to me for identification from the Bernice P. Bishop Museum (Honolulu) and the Muséum national d'Histoire naturelle (Paris). Most of the specimens from the Bishop Museum were collected 1945-1965 by a number of individuals, especially J. L. GRESSITT, N. KRAUSS, C. M. YOSHIMOTO, T. C. MAA, J. SEDLACEK, and R. STRAATMAN.

Specimens from the Muséum national d'Histoire naturelle were collected through the cooperation of ORSTOM (French Institute of Scientific Research and Development Through Cooperation, Nouméa). The efforts of Jean CHAZEAU, Loïc MATILE, Simon TILLIER, Annie TILLIER, and their co-workers from 1983 to 1988 were paramount. Additionally, John DUGDALE (Auckland Museum, New Zealand) had, during 1978, collected specimens which he sent to me for study. The collection of C. P. ALEXANDER contained several specimens other than the holotypes, and these were included in the study.

More than 5000 specimens have been examined for this study. Including one species of Tanyderidae, the total number of crane-fly species known to occur in New Caledonia is 89, in 40 subgenera and 18 genera.

METHODS

In the course of this study several hundred microscope slides were made for the purpose of viewing wing venation and genital structure. Former methods which used hydroxide solutions for the maceration of tissues consistently result in the breakdown of very thin membranes. A less traumatic method of maceration involves the use of acetic corrosive (MITCHELL & COOK, 1952) which, while not macerating tissues that have been stored in alcohol well, does expand and clear parts, leaving them intact for viewing without the breakdown of membranes. Further clearing of parts occurs when these are then washed in 100 % alcohol, then in xylene, and then mounted in xylene-based plastic polymers.

IDENTIFICATION CHARACTERS

The distinguishing characters used are standard for the Tipulidae. Discussions of these characters may be found in a number of published works, especially that of MCALPINE (1981). Gonostylus (for dististyle), gonocoxite (for basistyle), and paramere (for gonapophysis) have been used throughout. Venational terminology follows that suggested by BYERS (1989) for the cubital region of the wing.

C. P. ALEXANDER provided many keys in the thousands of pages he wrote about Tipulidae. I am indebted to his insight and have made liberal

Source : MNHN, Paris

use of many of his suggested key characters for the separation of groups. I attempted to avoid the use of frail structures such as the legs and antennae, which are very often damaged or missing. I looked for characters which were present in both male and female specimens. It would be nice to be able to report that I was even partially successful in these attempts, but such is not the case. In almost every genus, the use of characters from the antennae and legs is necessary for the separation of species.

A great amount of variation in characters was expected. Characters such as color and/or pattern of the abdomen, details of venation, and size were especially variable. In most cases, the structure of the male genitalia provided the only characters that could be used with confidence in the separation of the species. The characters found in the females were so variable that in any given key couplet two or more species may be indicated. In those cases where separation of the females is possible, the characters for doing so are indicated either in the key, or in the comments following the listing of the species. Overly striking variations, or problems caused by variation in some species, are mentioned in the comments following each listing. Unfortunately, several species have been described from the female, with no males available. In some of these cases the holotypes of described species represent variations of another described form and the names are placed in synonomy. In other cases, a male has been found and is described.

Habitats

Alexander (1945) supplied information about several habitats from New Caledonia, but Holloway (1979) provided much more extensive descriptions of many habitats. The habitats to which they referred are essentially the same at the time of this writing and need not be expanded further.

More than a third of the total number of species in New Caledonia have been found to reside in the area of the Rivière Bleue Preserve. I believe that further collection and study will increase this number. Additionally, the bulk of all specimens studied came from this area. This wealth of material is due to the efforts of Jean Chazeau. The preserve is about 20-30 kilometers north of Ouénarou, in what is referred to as " dense rain-forest ", and has been described by Bonnet de Larbogne *et al.* (1991). There are four collecting stations at which studies have been concentrated. The first is Station No. 5 (elevation 150 m), located in the flood plain near the banks of the Rivière Bleue. This site is flooded many times during the rainy season, and water remains standing for long periods of time after such flooding. Station No. 6 (elevation 160 m), also located near the edges of the river, is essentially the same vegetational type, but is not periodically flooded by the river during the rainy season. Station No. 7 (elevation 170 m) is a steep hillside habitat and has some major differences in the vegetation as well as being considerably drier than either Stations 5 or 6. The station with habitat refered to as " maquis " (elevation 310 m) is entirely different in its vegetational character and much drier than the other stations, even during the rainy season. In reporting the collections from these stations I have given only the elevations which correspond to that of the station.

The soil at these stations is typical of southern New Caledonia. It is generally the result of the breakdown of ultramafique rock, resulting in ever smaller nearly spherical particles, reddish and unable to hold enough organic material or moisture for the development of the immature stages of most (not all) Tipulidae. At all stations there are numerous fallen trees in various stages of decay. Stations 5 and 6 have numerous accumulations of small branches with interlacing mats of leaves on the forest floor. The accumulations are formed by run-off water, entrapping the small branches and leaves of various trees. As these accumulations break down, organic debris forms on the floor and between the various layers of leaves. This organic material serves as a major habitat for numerous larval forms of genera such as *Erioptera*, *Gynoplistia*, *Helius*, *Styringomyia* and *Toxorhina*.

The rotting trees themselves are externally punky and moist, and are the habitat for species of the genera *Elephantomyia*, *Epiphragma* and *Limonia*. These trees are often covered with

Source : MNHN, Paris

mosses which aid in keeping the underlying wood moist. The centers of the trees are packed with organic matter which contains larvae of genera such as *Amphineurus*, *Erioptera*, *Gymnastes*, *Leptotarsus*, *Molophilus*, *Ptilogyna* and *Styringomyia*.

The fronds from various species of the genus *Palmus* are also found on the forest floor. The rotted base of the petioles of these fronds is brown and syrupy, indicating the presence of polyphenolic compounds and sugars. This habitat holds enough organic material and moisture for the life cycles of several species, even during the drier season of the year. Genera often found in this habitat are *Elephantomyia*, *Epiphragma*, *Erioptera* (especially the subgenus *Meterioptera*), *Gymnastes*, *Helius*, *Limonia*, *Styringomyia* and *Toxorhina*. Notable exceptions to the occupation of these general habitats are (1) the genus *Paralimnophila*, of which the immatures are found along the edges of the river, in sand and gravel ; (2), the genus *Ptilogyna*, larvae of which are sometimes found on the floor of the rain forest in thin but apparently sufficient amounts of leaf debris ; and (3), the genus *Helius*, with larvae found in thin layers of leaf material next to smaller tributary streams, often submerged in the water.

Localities, Geographical and Seasonal Distribution

Adult crane-flies have been collected from 60 localities, most of which have been listed and mapped by Tillier (1988). The exceptions are : Mont Rembai (located near Col d'Amieu) ; La Crouen (near Canala) ; Kwa Niei (radio tower southeast of Grand Lac) ; Népoui Valley (north of Népoui) ; Ouaco (on coast in same area as Mont Taom) ; River Tou (near Goro along the southeasternmost coast of the island) ; Sarraméa (near La Foa) ; and Tao (near Mont Panié). On a very few of the labels, especially on older specimens, the localities have been misspelled. These have been corrected in the annotated list.

Most specimens were collected from the southern half of the island. Having traveled somewhat in the northern part of the island, where the terrain is very rugged and roads are not well developed, I can thoroughly appreciate the reasons for such a geographic bias.

The Loyalty Islands, located north of the main island, have received very little attention in terms of collections. Only two species are reported from this area, *Limonia (Pseudoglochina) microneura* Alexander, 1948, and *Limonia (Dicranomyia) pectinunguis* Tokunaga, 1940, the latter not yet found on the main island.

The distribution of the various species on the main island is subject to many influences. There are two seasons in New Caledonia, a wet season from approximately the middle or latter part of September to May or June, and a dry season in the rest of year. The term " dry " is relative, for there are still rains that occur during this period, especially on the northern and eastern coastal areas. However, during the drier season of the year, along the extreme coastal regions of the south and west, conditions are so dry as to preclude the presence of any tipulid species. Yet, not a kilometer away are habitats which very likely harbor a few to many of the species. In the northern part of the island, many hundreds of hectares have been subjected to fire in man's attempt to create grasslands for agriculture. Here, habitats have been totally destroyed. Sadly, the habitat will not recover, nor will the species once found there return.

There are no endemic genera to report. The only endemic subgenus is *Lipophragma*, of the genus *Epiphragma*, and even this may be but an artifact of human endeavors to explain the relationships between the genera *Epiphragma* and *Austrolimnophila*. The genus *Austrolimnophila* must be removed from the list of genera from New Caledonia, as the species previously reported is synonomous with *Epiphragma petulantia* Alexander. The subgenus *Eutoxorhina*, of the genus *Toxorhina*, is endemic to a small South Pacific area including New Caledonia and Fiji. The subgenus *Idiohelius*, of the genus *Helius*, has in like manner been discovered on Vanuatu (Alexander, 1953) to the north, as well as New Caledonia. The vast majority of the species of Tipulidae reported (87.6 %) are endemic.

There are several new records for the island. These include a first report of the family Tanyderidae with one new species in the genus *Radinoderus*. Within the family Tipulidae, there is a newly reported subgenus, *Rhampholimnobia*

Source : MNHN, Paris

of the genus *Helius*, with one new species, and there are two newly reported eriopterine genera, *Amphineurus* and *Cheilotrichia*, with one new species each. Within the genus *Erioptera*, the subgenus *Ctenerioptera* (ALEXANDER, 1961b) is represented by one species formerly placed in the closely related subgenus *Meterioptera*.

Almost as interesting are genera or subgenera not yet reported from New Caledonia. The subgenus *Toxorhina s. str.* is found over several island groups to the west, north, and east of New Caledonia, but is yet to be found in New Caledonia. The genus *Trentepohlia* is well represented in other island groups, extending eastward to the Samoas, and recently northward to the Hawaiian Islands (unpublished data), yet remains unrecorded in New Caledonia. Two endemic species of *Styringomyia* are recorded, but the ubiquitous South Pacific species *Styringomyia didyma* is yet to be found.

Discussions as to when and by what means the tipulid fauna reached New Caledonia are extremely speculative and have been based on meager data. Several assumptions involving other groups of insects, such as were proposed by HOLLOWAY (1979), have been made to show that New Caledonia has been invaded by species from other regions, i. e., directly from New Zealand, Australia, or New Guinea, or indirectly, traveling from numerous other islands forming the so-called " inner " or " outer " Melanesian archipelagos (ROSS, 1956). This is probably true for some species, but such invasions do not explain other cases, for in some species points might be made for migrations in the opposite direction. Work such as that presented here must be conducted at a number of other island groups before such assumptions can be considered established.

The available data indicate that most species are present as adults the year around, though many populations are apparently greatly reduced during the " dry " season of the year ; there is a distinct scarcity of specimens for these dates. The evidence indicates that all species are univoltine.

ABBREVIATIONS

The following are the abbreviations for the museums and collectors used in this paper :

Museums

Auckland Museum, New Zealand	AMNZ
Bernice P. Bishop Museum	BPBM
British Museum (Natural History)	BMNH
French Institute of Scientific Research and Development through Cooperation	ORSTOM
Muséum national d'Histoire naturelle, Paris	MNHN
National Museum of Natural History, Washington, D. C.	NMNH

Collectors

Wilfred CRABB	WC
Jean CHAZEAU	JC
Tracy CHURCHILL	TC
P. COCHEREAU	PC
T. D. A. COCKERELL	TDAC
Otto DEGNER	OD
A. P. DODD	APD
John S. DUGDALE	JSD
J. FAINICKA	JF
Pierre FAURAN	PF
K. J. FOX	KJF
D. T. FULLAWAY	DTF
Wayne C. GAGNÉ	WCG
L. R. GARRIGOU	LRG
W. GREENWOOD	WG
J. GUTIERREZ	JG
J. L. GRESSITT	JLG
John C. HERRON	JCH
C. Dennis HYNES	CDH
J. F. ILLINGWORTH	JFI
C. R. JOYCE	CRJ
Noël KRAUSS	NK
J. A. KUSCHE	JAK
L. BONNET DE LARBOGNE	LBL
T. C. MAA	TCM
H. E. MILLIREN	HEM
Danièle MATILE	DM
Loïc MATILE	LM
G. M. NISHIDA	GMN
Robert RAVEN	RR
C. F. REMINGTON	CFR
Jean RISBEC	JR
V. J. ROBINSON	VJR
G. A. SAMUELSON	GAS

Source : MNHN, Paris

J. SEDLACEK	JS	Annie TILLIER	AT
M. SEDLACEK	MS	Simon TILLIER	ST
R. STRAATMAN	RS	F. X. WILLIAMS	FXW
F. H. TAYLOR	FHT	C. M. YOSHIMOTO	CMY

SYSTEMATIC TREATMENT

The classification used is that followed by C. P. ALEXANDER. I have made one change, that being in the placement of the genus *Elephantomyia* which, on the basis of the morphology of the immatures, I now place in the *Eriopterini*. The placement of some other genera will probably be modified also as more data from their immatures are forthcoming.

Each species entry includes the following : name of species, synonymy, collection records. The first record represents the holotype, and depository. Each succeeding record lists the material examined which includes locality, date, altitude, collector, deposition. The localities are first listed alphabetically, then according to sequential monthly dates, as allowable. This information may be followed by a brief discussion of taxonomic status, further descriptive information, distribution, or other information about the biology of the genus or species.

As collections from the Rivière Bleue Preserve were very numerous, for many species I have briefly described a year-long profile of abundance, instead of recording each separate collection. These profiles involve specimens collected from Malaise traps at approximately two-week intervals, extending over one to one and a half years.

In his description of several species, ALEXANDER did not supply drawings of the male hypopygia. I have included drawings of those species of which the male is now known, or where I felt that ALEXANDER's drawings were inadequate for identification.

Because of the cooperation between curators of the Bishop Museum, Muséum national d'Histoire naturelle, and the National Museum of Natural History, I have been able to deposit paratypes and/or " standards " for many species at those institutions that do not harbor the holotype.

ANNOTATED LIST OF SPECIES

Family TANYDERIDAE

Radinoderus caledoniana n. sp.

(fig. 1)

Description (holotype, sex ?) : length of wing 11.5 mm. Rostrum about 3/4 length of remainder of head. Antennal scape brown, pedicel and flagellomeres brownish yellow, the very tips and bases of each segment dark brown, covered with pubescence about 1/2 length of segment. Vertex protuberant anteriorly, slightly carinate posteriorly, narrowed near midlength to about width of one facet ; grayish pruinose flecked with brown ; posterior vertex with elongate, median dark brown spot. Cervical plates dark brown. Pronotum yellowish brown with dark brown medial stripe. Mesonotum with 3 dark brown stripes, interspaces from humeral areas to posterior margin yellow and pruinose ; lateral stripes extending back to scutellum, broken at anterior edge of posterior scutellum, becoming dark brown on lobes ; dorsal stripe with dark brown middle and lateral lines, extending back to posterior tip of postscutellum ; mediotergite with a yellow anterior triangular area, posterior of triangle dark brown. Pleura brown, a yellow dorso-ventral stripe extending along posterior edge of paratergite, anterior to base of wing down through dorsal katepisternum ; anterior face of anepisternum bright yellow. Haltere stem yellow, knob dark brown. Legs with coxae yellow, dark brown on anterior faces ; trochanters yellow. Fore and middle femora with 4 subequal rings, basal ring yellow, a brown ring, yellow ring, and a distal brown ring. Tibiae with basal 2/3 dark brown, distal tip slightly brown, middle area yellow ; tarsus of foreleg entirely yellow, remainder of legs missing. Wings (fig. 1) whitish subhyaline with dark brown pattern, veins yellow, dark brown in colored areas. Pattern consisting of 3 bands, basal and 2nd connected along vein Cu, and 2nd and 3rd connected along cells C, Sc, and R_1. The 1st band extending from base of wing and anal angle to 1/5 the leading edge of wing ; white spots before arculus and near bases of cells C, R, and M midway between arculus and origin of Rs ; white spots also along origin of Rs and cell Sc at same level. Dark bands are somewhat X-shaped with white interspaces and spots as indicated in Figure 1. Venation : Rs mostly straight, outer 2/5 slightly curved ; tip of vein R_1 curved cephalad, R_2 curved caudad, its tip only

Source : MNHN, Paris

slightly turned cephalad ; m-cu just beyond base of M_4 ; cell 1st M_2 elongate, about 5-6 × its basal width ; inner margin of cell 2nd M_2 far proximad of base of cell M_1 ; wing margin of cell M_4 about 4 × m-cu. Right wing of holotype with an adventitious cross-vein at base of cell R_2 (not shown in figure). Abdominal terga brown, marked with yellow extending from anterior lateral edges, slightly medially to about 3/4 length of segment. Posterior medial borders of terga obscure yellow. Sterna darker brown, medial borders brownish yellow. Abdominal segments beyond segment 3, missing.

Type material : holotype (sex ?) : New Caledonia, Mont Mou, 160-260 m, XII-6-1983 (L. MATILE), slide 3014 (wing) ; deposited in MNHN.

Type locality : Mont Mou, 160-260 m.

Discussion : this is the first record of the family Tanyderidae from New Caledonia and brings the number of species in the genus *Radinoderus* to twelve. The geographically closest forms are *R. holwayi* Alexander and *R. solomonis* Alexander on Guadalcanal to the north. Several other species are in New Guinea and Australia. The new species is readily told from all other species by the combination of colored rings on the femora and tibiae as well as differences in the wing pattern.

Family TIPULIDAE

Subfamily TIPULINAE

Dolichopeza (D.) austrocaledonica Alexander

(figs 2-3)

Dolichopeza (D.) austrocaledonica Alexander, 1948a : 138 (male).

Records : Mont Mou, II-1947, 315 m (900 ft) (LRG) (NMNH) ; Forêt de la Thi, I-4-1979 (PF) (MNHN) ; Forêt de la Thi, XI-18/28-1983, 250 m (LM) (MNHN) ; Mont Koghis, I-26/30-1963, 500 m (CMY) (BPBM) ; Mont Koghis, XII-1-1963, 500-700 m (RS) (BPBM) ; Mont Koghis, XII-4-1963 and XII-7/8-1963, 500 m (RS) (BPBM) ; Port Boisé, X-25/XI-21-1988, 3 m (JC, CDH) (MNHN).

This species is well represented in all Malaise trap collections from Rivière Bleue, the profile showing no particular peaks of emergence.

Leptotarsus (Macromastix) albipedis n. sp.

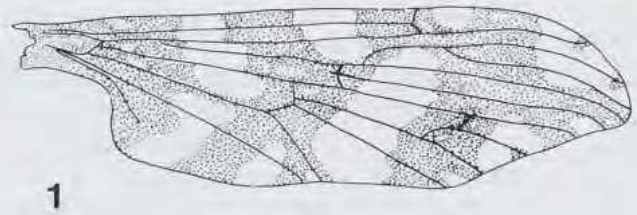
(fig. 4)

Description (male) : length : 5.4 mm ; wing : 8.5 mm. Rostrum very short, brownish yellow, lighter beneath ; head and vertex brownish yellow, lighter around orbits. Antennae apparently 12 segmented, reaching beyond tip of wing ; scape, pedicel yellow, flagellomeres dark brown. Pronotum yellow ; mesonotum yellowish brown, grading to brown on postscutellum, scutellum, and mediotergite. Halteres brown, narrowly yellow at base. Pleura uniformly yellow. Coxae yellow, trochanters slightly darker ; femora brownish yellow at base, grading to dark brown apically ; tibiae dark brown ; remainder of fore and middle legs dark brown ; hind legs with basitarsus, proximal half of second segment and last tarsal segment dark brown, rest of tarsus abruptly snowy white ; claws simple. Abdominal terga 1-7 dark brown, posterior edges slightly yellow ; sterna yellow, posterior edges slightly darker ; 8th and 9th segments dark brown. Wings weakly infuscated, oval stigma and cell Sc brown ; extreme tip of wing slightly infumed ; veins dark brown. Macrotrichia on R before fork, entire length of R_1, R_2, R_{2+3}, R_{4+5}, outer two-thirds of M_1 and M_2, entire length of M_3 and M_4. Venation : R_{4+5} very short, about 1/3 r-m ; r-m subequal to m ; basal section of M_3 not in transverse alignment with m but same length as M_{3+4} ; m-cu before fork of M_{3+4} ; cell 1st M_2 curved ; cell M_1 deep, about 4 1/2 × the length of its petiole ; cell 2A wide. Hypopygium with posterior border of 9th tergum broadly U-shaped ; gonocoxites large, inner surface covered by a characteristic and striking dark brown patch covered with short dark setae. Gonostylus forming a single unit from narrow base ; outer style extremely short, a small lobe on outer surface, covered with a patch of long dark setae ; shaft divided, set with spines interspersed with long thick setae apically ; rostrum thick, blunt, covered on entire outer surface with short thick spines.

Type material : holotype (male) : New Caledonia, Mont Do, XI-27-1983, 900-950 m (L. MATILE and J. CHAZEAU), slide 3047. Paratypes: 1 male, same data as for holotype, slide 3040 ; 1 sp. (sex ?), same data as for holotype (L. MATILE) (MNHN). The holotype and paratypes are deposited in the MNHN.

Type locality : Mont Do, 900-950 m.

Source : MNHN, Paris



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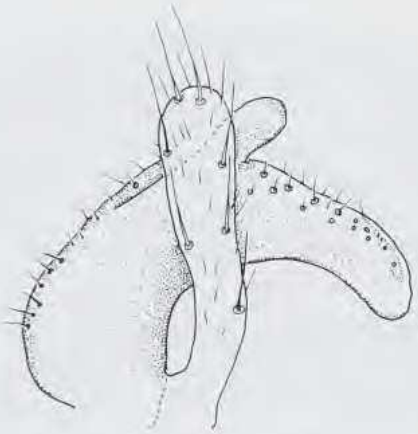

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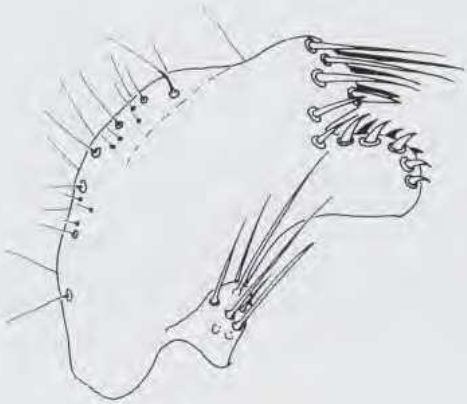

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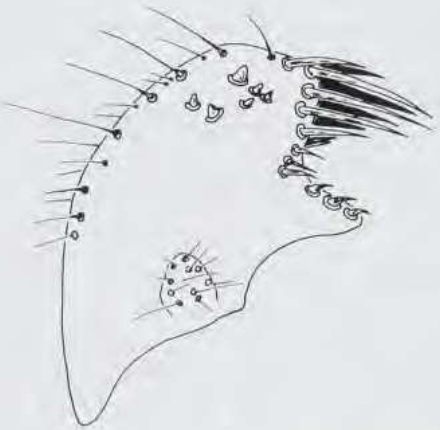

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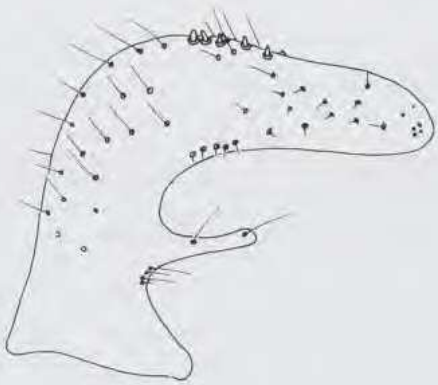

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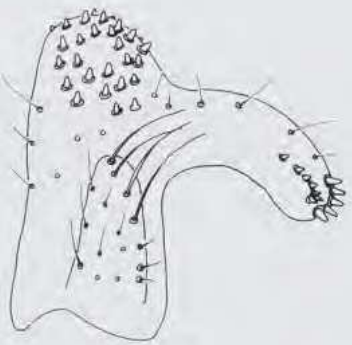

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FIGS 1-7.— 1 : *Radinoderus caledoniana* n. sp., wing ; 2 : *Dolichopeza (Dolichopeza) austrocaledonica* Alex., wing ; 3 : *D (D.) austrocaledonica* Alex., gonostylus ; 4 : *Leptotarsus (Macromastix) albipedis* n. sp., gonostylus ; 5 : *L. (M.) cockerellae* Alex., gonostylus ; 6 : *L. (M.) glabristylus* n. sp., gonostylus ; 7 : *L (M.) mixtus* n. sp., gonostylus.

Source : MNHN, Paris

Leptotarsus (Macromastix) caledoniana (Alexander)

Macromastix caledoniana Alexander, 1934b : 443 (male) (wing).
Leptotarsus (Macromastix) caledoniana Alexander, 1948b : 367 (male).

Records : Ponérihouen, VII-7-1931, (JR) (NMNH) ; Col d'Amieu, X-17/18-1978 (JSD) (AMNZ) ; Mont Koghis, XI-18-1983, 500-600 m (LM) (MNHN) ; Rivière Bleue, XI-4-1974 (JLG) (BPBM).

Leptotarsus (Macromastix) cockerellae (Alexander)

(fig. 5)

Macromastix cockerellae Alexander, 1929 : 85 (male) (wing).
Leptotarsus (Macromastix) repleta Alexander, 1948b : 367 (male) (wing, hypopygium), **n. syn**.
Leptotarsus (Macromastix) brachycerus Alexander, 1978a : 100 (female) (wing, antenna), **n. syn**.

Records : Bourail, V-22-1928 (TDAC) (NMNH) ; Bourail, V-26-1928 (TDAC) (NMNH) ; Canala apr. Col d'Amieu, XII-12-1983, 300-350 m (LM) (MNHN) ; Dzumac, V-10-1979 (PF) (MNHN) ; Forêt de la Thi, VIII-10-1978 (PF) (MNHN) ; Forêt de la Thi, XI-18-1983, 150-250 m (LM) (MNHN) ; Mont Do, XI-27-1983, 900-950 m (LM, JC) (MNHN) ; Mont Koghis, XI-12-1958 (CRJ) (BPBM) ; Mont Koghis, XI-15-1983, 500-600 m (LM) (MNHN) ; Mont Koghis, XII-3-1983, 420-440 m (LM) (MNHN) ; Rivière Bleue, IV-6/20-1986 and V-26/VI-6-1986, 150 m (LBL, JC) (MNHN) ; VI-3/16-1987 and VI-20/VII-4-1986, 150 m (LBL, JC, AT, ST) (MNHN) ; Sarraméa, II-1971, 70-100 m (NK) (NMNH) ; XI-30-1983, 140 m (LM) (MNHN) ; VI-1968 (PC) (MNHN) ; VI-22-1971 (PC) (MNHN) ; XI-30-1983, 140 m (DM, LM) (MNHN) ; St. Louis, XI-4-1945, 385 m (1100 ft) (JCH) (NMNH) ; between Thio and Nakety, XI-12-1958 (CRJ) (BPBM).

Leptotarsus (Macromastix) glabristylus n. sp.

(fig. 6)

Description (male) : length minus frontal prolongation 10.9 mm ; wing 14.0-14.5 mm. Head brownish yellow ; snout about 1/2 remainder of head ; antennae short ; basal segments brownish yellow becoming lighter on distal segments. Pronotum yellow medially, brown on extreme lateral edges continuing to base of propleura. Mesonotum dark brown, or with barely perceptible yellow stripes on either side of dark brown midline ; scutellum yellowish brown ; mediotergite yellowish brown becoming darker on edges. Pleura brown, or variegated with yellow brown. Haltere yellowish brown at base becoming yellow on distal half. Coxae and trochanters brownish yellow ; femora and tibiae yellow with dark brown distal ring, remainder of leg yellow ; tarsal claws simple. Abdominal terga dark brown ; sterna 1-7 yellow with extreme posterior edge dark brown ; 8th and 9th segments entirely brown. Wing with light brownish tinge, veins brown. Dark brown stripe from arculus to stigma broken by yellow spot just beyond arculus and immediately before stigma ; dark brown along cord. Venation : Rs straight, slightly shorter than R_{2+3+4}. R_{2+3} very short, about 1/2 basal section of R_5. Basal section of R_5 and r-m subequal ; basal section of M_3 about 1 1/2 × M_{3+4} ; cell M_2 a little less than 4 × length of petiole ; m-cu slightly beyond fork of M. Hypopygium brown, 9th tergum emarginate with small but deep notch medially. Outer lobe of gonostylus lacking, remaining shaft with two lateral arms ; dorsal arm thick, with strong blunt spines at base of arm but no spines along inner edge ; medial arm 1/2 outer arm, with single seta at midlength and at tip.

Type material : holotype (male) : New Caledonia, Rivière Bleue, 166°40′06″ E, 22°06′05″ S, V-6/21-1987, 310 m, maquis (L. BONNET DE LARBOGNE, J. CHAZEAU, A. and S. TILLIER), slide 3098 (whole mount). Paratypes (same data as for holotype except date) : 1 male, 3 females, III-6/16-1987, slides 3086, 3087, 3088, 3099 ; 1 male, 2 females, VII-6/16-1987, slides 3086, 3087, 3099 ; 3 males, 2 females, V-6/21-1987, slides 3180, 3174, 3175, 3176, 3084 ; 3 males, 1 female, V-21/VI-3-1987, alcohol specimens ; 1 male, VI-3/16-1987, slide 3088 ; 1 male, VI-16/VII-7-1987, slide 3144. One paratype is deposited in the NMNH, and one in the BPBM. The holotype and all other paratypes are deposited in the MNHN.

Type locality : Rivière Bleue, maquis sur crête, 310 m.

Source : MNHN, Paris

Leptotarsus (Macromastix) mixtus n. sp.

(fig. 7)

Description (male) : length minus frontal prolongation 7.5 mm ; wing 11.3 mm ; frontal prolongation .8 mm ; head .55 mm. Head brownish yellow, frons projected between antennal bases ; scape, pedicel, and first flagellomeres brownish yellow, remaining flagellomeres darker ; palpi dark brown. Thorax, coxae, trochanters, femorae and tibiae, brownish yellow, tarsi darker brown. Halteres yellowish brown. Wings with yellow ground ; stigma and cell Sc darker. Veins dark brown, with fork of Rs, basal section of M_{1+2} and basal 2/3 of M_3 white ; no apparent macrotrichia on any veins. Venation : Rs slightly curved at origin ; R_{2+3} about 2 2/3 × anterior branch or Rs ; basal section of M_3 about 2 × M_{3+4} ; m-cu just before fork of M_{3+4}, about midlength cell 1st M_2. Abdominal terga brownish yellow with segments 3-8 brown on posterior 4th ; sternites yellow with brown stripe on posterior 8th of plate. Hypopygium brownish yellow. Ninth tergite slightly convex, with weak lobes on edges. Outer gonostylus short, cylindrical, obtuse at tip, covered with numerous setae about as long as the style. Small spines on apical end of shaft, posterior margin covered with long setae ; rostrum a fleshy, curved, blade, the outer face sparsely covered with setae ; inner tip produced into lip covered with row of thick spines.

Type material : holotype (male) : New Caledonia, Rivière Bleue, I-31/II-12-1987, 170 m (L. BONNET DE LARBOGNE, J. CHAZEAU), slide 3093 (whole mount). Paratypes : 2 males, same data as for holotype ; slides 3092, 3094 ; 1 female, Rivière Bleue, II-25/III-13-1987, 150 m (L. BONNET DE LARBOGNE, J. CHAZEAU, A. and S. TILLIER), slide 3112 ; 1 male, Rivière Bleue, IV-9/22-1987, 310 m (d°) ; 5 males, Rivière Bleue, V-6/21-1987, 310 m (d°), slides 3113, 3120, 3121, 3122, 1 alcohol specimen. One paratype is deposited in the BPBM, and one in the NMNH. The holotype and all other paratypes are deposited in the MNHN.

Type locality : Rivière Bleue, 170 m.

Leptotarsus (Macromastix) noelianus Alexander

Leptotarsus (Macromastix) noelianus Alexander, 1978a : 102 (male) (wing, hypopygium).

Records : Plateau de Dogny, II-4-1971, 150-900 m (NK) (NMNH) ; Col d'Amieu, X-15/17-1978 (JSD) (AMNZ) ; Col d'Amieu, X-21-1978, 450 m (JSD) (AMNZ) ; Mont Koghis, XI-15-1983, 500-600 m (LM) (MNHN) ; Mont Koghis, XII-3-1983, 420-440 m (LM) (MNHN) ; Mont Panié, XII-16-1983 (LM) (MNHN) ; Mont Rembai, X-18-1978, 700 m (JSD, KJF) (AMNZ) ; Rivière Bleue, IX-29/X-13-1986, 160 m (LBL, JC) (MNHN).

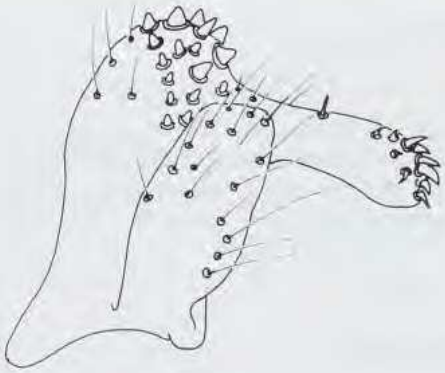
Leptotarsus (Macromastix) novocaledonica (Alexander)

(fig. 8)

Macromastix (Macromastix) novocaledonica Alexander, 1929 : 83 (male) (wing) ; 1948b : 367 (male) (hypopygium).
Macromastix (Macromastix) productifrons Alexander, 1945 : 368 (female), **n. syn**.
Macromastix (Macromastix) mouicola Alexander, 1951 : 578 (male), **n. syn**.
Leptotarsus (Macromastix) fulvithorax Alexander, 1978a : 101 (male) (wing, tarsus, palpus, antenna, hypopygium), **n. syn**.

Records : Plum Farm, V-30-VI-7-1928 (TDAC) (NMNH) ; Bourail, V-23-1928 (TDAC) (NMNH) ; Col d'Amieu, III-28-1968 (JLG) (BPBM) ; Forêt de la Thi, XI-12-1983, 250 m ; XI-18-1983, 150-250 m ; XI-18-28-1983, 250 m ; XI-28-1983 ; XI-28/XII-7-1983, 250 m (LM) (MNHN) ; Kwa Neie, X-4/13-1988, 480 m (JC, CDH) (MNHN) ; Mont Koghis, III-1959 (NK) (NMNH) ; Mont Koghis, XII-3-1983, 420-440 m (LM) (MNHN) ; Mont Mou, II-1949, 1400 m (4000 ft) (LRG) (NMNH) ; Nassirah, III-20-1968, 100 m (JLG) (BPBM) ; Nepoui Valley, VIII-1940 (FXW) (NMNH) ; Mont Panié, XI-24-1983, 250-300 m (LM) (MNHN) ; Plateau de Dogny, III-20-1968 (JLG, TCM,) (BPBM) ; Rivière Bleue, II-10/27-1988, 160 m (LBL, JC, AT, ST) (MNHN) ; II-20/III-12-1986, 160 m (LBL, JC) (MNHN) ; III-23/IV-1986, 160 m (LBL, JC) (MNHN) ; St. Louis, V-20-1945 (JCH) (NMNH).

Source : MNHN, Paris



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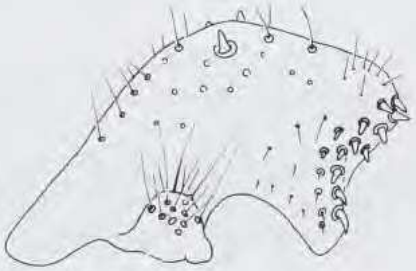

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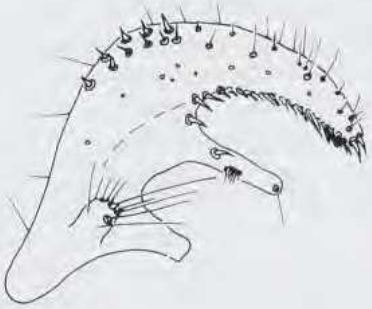

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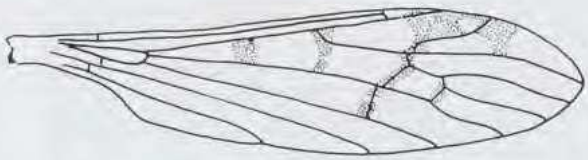

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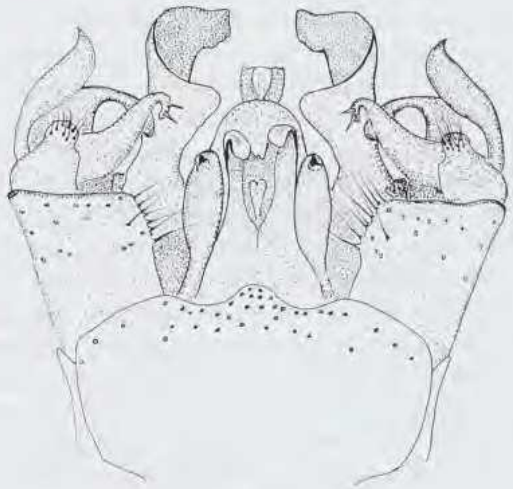

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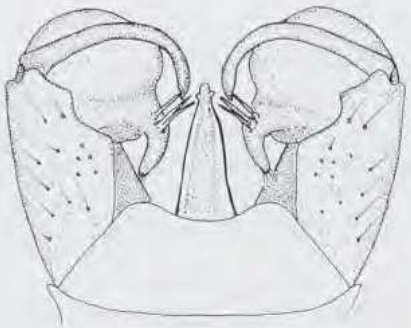

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FIGS 8-13. — 8 : *Leptotarsus (Macromastix) novocaledonica* Alex. ; gonostylus, lateral aspect ; 9 : *L. (M.) risbeci* Alex., gonostylus, lateral aspect ; 10 : *L. (M.) spinastylus* n. sp., gonostylus, lateral aspect ; 11 : *Helius (Rhamphoimnobia) matilei* n. sp., wing ; 12 : *Limonia (Atypopthalmus) taoensis* n. sp., hypopygium, dorsal aspect ; 13 : *L. (Dicranomyia) agape* Alex., hypopygium, dorsal aspect.

Source : MNHN, Paris

Leptotarsus (Macromastix) risbeci (Alexander)

(fig. 9)

Macromastix risbeci Alexander, 1934b : 441 (male) ; 1945 : 368 (male) (wing).

Records : Poindimié, VII-13-1931 (JR) (NMNH) ; Col d'Amieu, X-15/17-1978 ; X-17/18-1978 ; X-18/20-1978 ; X-21-1978 (JSD) (AMNZ) ; Forêt de la Thi, XI-18-1983, 150-250 m and XI-27/XII-7-1983, 250 m (LM) (MNHN) ; Kavatch (Hienghène), X-28-1978 (JSD) (AMNZ) ; Plateau de Dogny, IV-11-1973 (JLG) (BPBM).

Leptotarsus (Macromastix) spinastylus n. sp.

(fig. 10)

Description (male) : length minus frontal prolongation 7.4-10.0 mm ; wing 10.6-11.3 mm. Head light brown, vertex darker ; snout about 1/2 remainder of head. Antennae long (14.7 mm) ; scape and pedicel yellow, flagellomeres brown, covered with numerous short setae. Pronotum yellow, propleura slightly darker. Metanotum with 3 broad dark brown stripes, center stripe with a very thin, lighter, medial line ; scutum yellowish medially, dark brown laterally ; scutellum yellow ; mediotergite brown. Pleura brown, lighter on anepisternum and upper portion of katepisternum ; basal katepisternum dark brown. Halteres light brown, knobs darker. Prothoracic and mesothoracic coxae brown basally, yellow distally. Metathoracic coxae and all trochanters yellow. Remainder of legs dark brown. Abdominal terga dark brown with proximal margins yellow ; sterna yellow with posterior margins dark brown. Wings with faint brownish tint, darker along vein Cu. Cell Sc faintly yellower. Veins and stigma dark brown. Venation : Rs gently curved, a little longer than 1/2 length of R_{2+3+4}. R_{2+3} short, in cases punctiform ; R_2 very faint ; cell M_2 5 × length of its petiole, in some specimens sessile ; m-cu just beyond fork of M. Hypopygium brown ; 9th tergum shallowly emarginate. Gonostylus with outer lobe small, barely discernible ; shaft with outer lateral arm extended, thick, inner edge covered with numerous, strong spines. Medial arm of shaft small, thin, with 1 thick basal spine, and medial patch of small setae dorsally ; one seta at tip.

Type material : holotype (male) : New Caledonia, Mont Koghis, XII-3-1983, 420-440 m (Loïc MATILE), slide 3044 (wing, abdomen, genitalia). Paratype (male) : New Caledonia, Forêt de la Thi, VIII-10-1978 (P. FAURAN), slide 3097. The holotype and paratype are deposited in the MNHN.

Type locality : Mont Khogis, 420-440 m.

Discussion : ALEXANDER (1978a) divided the New Caledonian species of *Leptotarsus (Macromastix)* into two groups. The *cockerellae* group was characterized by males with long antennae, tarsal claws simple, and a snout the same length or shorter than the head. The species he assigned to this group were *Leptotarsus (M.) cockerellae* Alexander, *L. (M.) brachycerus* Alexander, *L. (M.) caledoniana* Alexander, *L. (M.) repleta* Alexander and *L. (M.) risbeci* Alexander. The second group, the *novocaledonica* group, included species with the male antennae short, tarsal claws bidentate, and the snout of the head long. Species assigned to this group, in addition to *Leptotarsus (M.) novocaledonica* Alexander, were *L. (M.) mouicola* Alexander, *L. (M.) noelianus* Alexander, and *L. (M.) productifrons* Alexander. It can be seen from the description above that *L. (M.) mixtus* has a mixture of the characters of the two groups, having simple tarsal claws but short antennae. Additionally, three characters showed a great deal of variation. These are (1) the length of the frontal prolongation (snout), (2) the intensity of the coloration of the wings and body, and (3), the size. Alexander did not examine the genitalia of most of his specimens. I am not entirely satisfied with the outcome of my study, which was limited to about 70 specimens. It becomes apparent that the male genitalia are the only character which can be used for separation of the species with confidence. The results of this study are as given in the species listings, with their accompanying synonymies. Separation of females into the various species is not possible with any confidence. It may be that the male of the new species *L. (M.) mixtus* represents the male of *L. brachycerus*, but the color variation, as well as differences in other characters, lead me to assume that such is not the case. I consider *L. (M.) brachycerus* as a variant of *L. (M.) cockerellae*. With these apparent problems in the group from New Caledonia, it is evident that the entire subgenus is in need of revision.

Source : MNHN, Paris

Ptilogyna (Plusiomyia) herroni (Alexander)

Phacelodocera herroni Alexander, 1948b : 370 (male) (antennae).
Ptilogyna (Plusiomyia) herroni (Alexander) : Dobrotworski, 1972 : 698 (male) (palp, wing, hypopygium).

Records : La Foa, IV-1945 (JCH) (NMNH) ; Col de Pirogue, II-14-1963 (CMY) (BPBM) ; FRT. d'Adio (Poya), XI-13-1983, 220 m (PF) (MNHN) ; Hienghène, XI-25-1983, 5-10 m (LM) (MNHN) ; La Foa, I-14-1945 (JCH) (NMNH) ; Mont Koghis, I-13-1978 (JF) (MNHN) ; Mont Koghis, II-15-1963 (CMY) (BPBM) ; Mont Koghis, III-19-1968, 350-600 m (JLG, TCM) (BPBM) ; Mont Mou, II-1947, 315 m (900 ft) (LRG) (NMNH) ; Mont Mou, II-IV-1947 (LRG) (NMNH) ; Mont Mou, XI-22-1983, 360 m (LM) (MNHN) ; Mont Panié, XII-11-16-1983, 360 m (LM) (MNHN) ; St. Louis, I-22-1946, 420 m (1200 ft) and XII-30-1945 (JCH) (NMNH).

Ptilogyna (Plusiomyia) margaritae (Alexander)

Phacelodocera margaritae Alexander, 1948b : 371 (male).
Ptilogyna (Plusiomyia) margaritae (Alexander), Dobrotworski, 1972 : 700 (male) (head, palp, wing, hypopygium).

Records : Mont Mou, IV-1947, 315 m (900 ft) (LRG) (NMNH) ; Mont Koghis, III-19-1963, 300-600 m (JLG, TCM) (BPBM) ; Mont Panié, XII-11-1983, 260-360 m and XII-11/16-1983, 360 m (LM) (MNHN).

Ptilogyna (Plusiomyia) neocaledonica (Alexander)

Plusiomyia neocaledonica Alexander, 1948b : 368 (male) (wing, antenna).

Records : St. Louis, XII-22-1946, 385 m (1100 ft) (LRG) ; Forêt de la Thi, XI-27-1983 and XI-28-1983 150-250 m (LM) (MNHN) ; Kwa Neie, Forêt Nord, X-13/25-1988, 460 m (JC, CDH) (MNHN) ; Rivière Bleue, II-25/III-13-1987, 160 m and II-25/III-13-1987, 150 m (LBL, JC, AT, ST) (MNHN) ; St. Louis, I-22-1946 (JH) (NMNH) ; St. Louis, XI-1945 (JCH) (NMNH).

Subfamily **LIMONIINAE**

Tribe *LIMONIINI*

Helius (Eurhamphidia) mouensis Alexander

Helius (Eurhamphidia) mouensis Alexander, 1948b : 383 (male) (wing).

Records : Mont Mou, XII-1945, 1400 m (4000 ft) (JCH) (NMNH) ; Forêt de la Thi, I-4-1979 (PF) (MNHN) ; Mont Do, XI-27-1983, 900-950 m (LM) (MNHN) ; Mont Panié, XII-11/16-1983, 260-360 m and XII-16-1983, 360 m (LM) (MNHN) ; Rivière Bleue, II-6/20-1986, 160 m ; II-20/III-12-1986, 160 m ; III-27/IV-11-1986, 160 m ; IV-11/23-1986, 160 m ; IV-23/V-19-1986, 160 m (LBL, JC) (MNHN) ; VIII-1/14-1986, 170 m and IX-1/15-1986, 150 m (LBL, JC, AT, ST) (MNHN).

Remarks : specimens from the Rivière Bleue collections show some characters not mentioned by ALEXANDER. The very short vein r-m is present in some specimens and lacking in others. Additionally, the outer 1/10 of the femora, and the outer 1/5 of the tibiae, and all tarsal segments are white. The genitalia are precisely as described by ALEXANDER (1948b).

Source : MNHN, Paris

Helius (Helius) aphrophilus Alexander

Helius (Helius) aphrophilus Alexander, 1948a :141 (male).

Records : Mont Mou, XII-1946-III-1947 (JCH) (NMNH) ; Col d'Amieu, XI-30-1983, 420 m (DM, LM) (MNHN) ; Mont Dzumac, V-10-1979 (PF) (MNHN) ; Forêt de la Thi, X-30-1967 (JS, MS) (BPBM) ; La Crouen, III-22/23-1968, 150 m (JLG, TCM) (BPBM) ; Mont Koghis, II-15-1963 (CYM) (BPBM) ; Mont Koghis, IX-30-1988 (CDH) (MNHN) ; Pouébo, I-27-1964, 100 m (RS) (BPBM) ; La Foa, II-26/IV-25-1945 (FXR) (BPBM) ; Mont Mou, XII-2/30-1945 (JCH) (BPBM) ; Mont Mou, XII-18-1988 (CDH) (MNHN) ; Ouaco, X-20-1958 (CRJ) (BPBM) ; Rivière Bleue, III-12/27-1986, 160 m and VIII-9/26-1987, 150 m (LBL, JC) (MNHN) ; IX-29/X-13-1986, 160 m (LBL, JC, AT, ST) (MNHN) ; Sarraméa, II-12-1963 (CMY, NK) (BPBM) ; St. Louis Valley, VI-5-1945 (HEM) (BPBM) ; between Thio and Nakéty, XI-12-1958 (CRJ) (BPBM) ; Tiwaka (Poindimié), XI-22/24-1983 (LM) (MNHN) ; Yaté, IX-18-1988 (CDH) (MNHN).

Remarks : specimens examined show that the m-cu cross-vein may be just beyond to slightly before the fork of M. All other venational characters are fairly constant.

Helius (Helius) neocaledonicus Alexander

Helius (Helius) neocaledonicus Alexander, 1945 : 239 (female) (wing).

Records : Thi River Valley, XI-8-1940 (FXW) (NMNH) ; Col des Roussettes, II-4/6-1963, 450-550 m (JLG) (BPBM) ; Kwa Neie, X-4/13-1988, 460 m (JC, CDH) (MNHN) ; Rivière Bleue, IX-27-1988 and X-4-1988, 160 m (CDH) (MNHN).

Remark : a Rivière Bleue profile indicates this species present at all times during the year, with a peak emergence during December, January, and February.

Helius (Helius) stolidus Alexander

Helius (Helius) stolidus Alexander, 1948b : 381 (male) (wing, hypopygium).

Records : Mont Mou, XII-16-1945, 1400 m (4000 ft) (JCH) (NMNH) ; Col des Roussettes, II-4/6-1963, 450-550 m (JLG) (BPBM) ; Kwa Neie, X-4/13-1988, 460 m (JC, CDH) ; Mont Do, XI-27-1983, 900-950 m (LM, JC) (MNHN) ; Mont Koghis, I-26/30-1963 and I-27-1963 (CMY, NK) (BPBM) ; Mont Koghis, II-15-1963 and (NK) (BPBM) ; Mont Koghis, XI-15-1983, 500-600 m (LM) (MNHN) ; Mont Koghis, XI-29-1963, 500 m and XII-1-1963, 500-700 m (RS) (BPBM) ; Mont Panié, XI-24-1983, 250-300 m (LM) (MNHN) ; Plaine des Lacs, XI-5-1958 (CJR) (BPBM).

Remark : a Rivière Bleue abundance profile indicates this species present all year, with no peak of emergence indicated.

Helius (Idiohelius) pentaneura Alexander

Helius (Idiohelius) pentaneura Alexander, 1948b : 382 (female) (wing).

Records : St. Louis, X-20-1945, 420 m (1200 ft) (JCH) (NMNH) ; Forêt de la Thi, XI-28-1983, 150-250 m (LM) (MNHN) ; Mont Koghis, XI-11-1976, 400-500 m (NK) (BPBM) ; Mont Koghis, XI-16-1983, 200-300 m (LM) (MNHN) ; Mont Mou, XI-16-1983, 200-250 m (LM) (MNHN) ; Rivière Bleue, IX-27-1988,160 m and X-4-1988, 160 m (CDH) (MNHN) ; St. Louis, XII-30-1945, 385 m (1100 ft) (JCH) (NMNH).

Remark : a Rivière Bleue abundance profile, along with rearing data, indicates the presence of adults during the entire year, with no peaks of emergence.

Source : MNHN, Paris

Helius (Rhampholimnobia) matilei n. sp.

(fig. 11)

Description (male) : length, excluding rostrum, about 3.9 mm ; wing 5.2 mm ; rostrum 1.8 mm. Head brown ; rostrum about one and a half times length of thorax, black ; antennae black, basal segments oval, outer segments nearly cylindrical, covered with small whitish setae, other setae subequal to length of segment. Thorax brown ; on either side of prescutum a yellowish brown stripe extending back to anterior scutal area continuing to base of wing as whitish pruinosity. Halteres whitish yellow at base of stem, remainder brown. Base of wing yellow, passing to gray brown ground color. Dark brown bands across cell R at 1/3 length from base and at origin of Rs ; stigma, seams over cord and outer end of cell 1st M_2, a broad band at tip of vein R_3, and faintly evident over anterior area of cell R_3 also dark brown. Circular area between stigma and tip of vein R_3 abruptly white. Venation : Sc ending opposite 3/4 length Rs, Sc_2 very slightly longer than Sc_1 ; r-m slightly longer than second section of Rs ; cell R_3 abruptly widened at margin, a little more than 2 × cell R_1 at wing margin. Abdomen mostly dark brown ; 9th segment yellow. Base of gonocoxite yellow, remainder dark brown. Gonocoxite with dense tuberculate setae on apical and inner basal margins. Outer gonostylus a slightly curved rod, slightly bifid at tip. Inner gonostylus longer, outer third narrower, outer margin with several tuberculate setae. Aedeagus short, thick.

Type material : holotype (male) : New Caledonia, Col d'Amieu, 300-500 m, XII-2-1983 (L. MATILE), slide 3001 (wing and genitalia). Allotype : (female) : same data as for holotype. The holotype and allotype are deposited in the MNHN.

Type locality : Col d'Amieu, 300-500 m.

Derivatio nominis : this species is named after the collector, Loïc MATILE.

Discussion : this is the first record of the subgenus in New Caledonia. At first glance, the species might be confused with the superficially similar *Helius (H.) aphrophilus* Alexander, in which the wing markings are lighter and the gonocoxites are entirely yellow ; there are also the subgeneric venational differences.

Larvae of the genus *Helius* were found in thin mats of leaf material on the edges of small creeks, often submerged. The larvae are remarkable in their ability to skeletonize the leaves in a very short time. Observations of individuals in the rearing cages indicate that this activity can only be described as voracious.

Limonia (Atypophthalmus) taoensis n. sp.

(fig. 12)

Description (male) : length 3.5 mm ; wing 5.5 mm. Head and antennae dark brown ; rostrum and palps brownish yellow. Pronotum brown. Mesonotal prescutum obscure yellow on either side of dark brown median stripe, anterior lateral edges dark brown. Pleura yellow with conspicuous brown stripe extending from cervical area back to abdomen. Halteres yellow at base, brown along stem, knob brown basally and yellow at apex. Coxae, trochanters and basal 1/2-2/3 of femora obscure yellow, remainder of legs dark brown. Wings tinged with brown, stigma brown with pale brown washes at origin of Rs, tip of Sc_1, seams along cord, and outer end of cell 1st M_2. Venation : Sc_1 ending opposite midlength of Rs ; Rs very slightly angulated about 1/10 its length from origin. Cell 1st M_2 closed ; m-cu at fork of M. Abdominal terga and sterna dark brown, ringed with yellow basally. Male hypopygium with gonocoxite small, its mesocaudal angle produced into a curved structure, upper surface forming a triangular ledge with minute spinulae along outer edge, lower surface extending beyond upper ledge forming a thin, weakly sclerotized plate ; outer gonostylus a heavily sclerotized arm, expanded near midlength, covered with closely parallel ridges, narrowing to an acute apex curved strongly laterad. Inner gonostylus with 2 arms ; outer arm fleshy, bent or curved sharply mesad and cephalad, 2 strong spines near apex ; inner arm very thick and fleshy at base, narrowing then expanding slightly to form club-like structure, numerous setae on outer surface (these not shown in figure). Parameres broadly based, bilobed, inner lobe with a very thick, blunt, dark, dorsal spine near apex ; tip of the aedeagus forked into 2 short tubular extensions, with a membrane between them.

Type material : holotype (male) : New Caledonia, Tao, II-9-1963 (C. M. YOSHIMOTO and N. KRAUSS), BPBM slide 2256 (wing and genitalia). Paratypes : 4 males, same data as for holotype ; 1 male, New Caledonia, Paita, VIII-2-1979 (P. FAURAN), slide 3030 ; 1 female, New Caledonia, Paita, VIII-2-1979 (P. FAURAN) ; New Caledonia, Tao, II-8/10-1963 (C. M. YOSHIMOTO), BPBM slide 2263 (genitalia) ; New Caledonia, Nouméa (Anse Vata), XI-8-1958 (C. R. JOYCE), BPBM slide 2262 (wing and genitalia). The holotype is deposited in the BPBM. One paratype is deposited in the NMNH. All other paratypes to MNHN and BPBM.

Type locality : Tao.

Discussion : these are the first records of the subgenus from New Caledonia. The wing vena-

Source : MNHN, Paris

tion and the coloration of the body of *Limonia (Atypophthalmus) taoensis* are almost precisely like these found in typical *L. (A.) umbrata* De Meijere (1911). ALEXANDER (1941) described a subspecies from New Guinea, *L. (A.) umbrata perreducta*, indicating that the parameres ended in a spine. BYERS (1966) indicates no such spine in drawings of the genitalia of that which he considered as typical *umbrata*. After reviewing this information and several specimens of *umbrata*, I consider *perreducta* as a full species (***n. stat.***). The specimens which I have examined from New Caledonia have a very short, blunt spine at the tip of the parameres, which is quite different from *perreducta*. The concept of *umbrata* should not be considered as a widely distributed, single species, but rather one of a group of species which show differences (though slight) in the parameres, the extension of the gonocoxite, the aedeagus, and the outer and inner gonostylus.

Limonia (Dicranomyia) agape Alexander

(fig. 13)

Limonia (Dicranomyia) agape Alexander, 1948b : 375 (female) (wing).

Records : St. Louis, I-22-1946, 366 m (1200 ft) (JCH) (NMNH) ; Col des Roussettes, II-4/6-1963, 450-550 m (JLG, CMY) (BPBM) ; Mont Koghis, XII-4-1963, 500 m (RS) (BPBM) ; Rivière Bleue, III-26/IV-9-1987, 170 m ; III-26/IV-9-1987, 310 m ; IV-9/24-1987, 170 m ; V-6/21-87, 170 m (LBL, JC, AT, ST) (MNHN) ; V-26/VI-6-1986, 150 m (LBL, JC) (MNHN).

Remark : ALEXANDER described this species from a female. I have one male of a form which appears to reflect Alexander's description in every respect. I am assuming this male represents the same species as the female holotype.

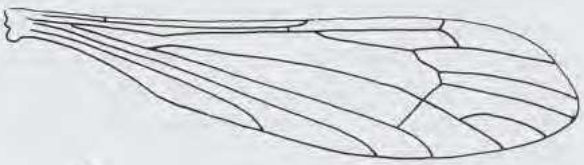
Limonia (Dicranomyia) boulariensis n. sp.

(figs 14-15)

Description (male) : length 2.9 mm ; wing 3.3 mm. Head including rostrum and antennae, dark brown to black. Antennal segments covered with yellowish brown setae 1/2 length of segments. Prescutum light brown anteriorly, dark brown posteriorly. Pleura uniformly chestnut brown ; halteres dark brown. Coxae and trochanters chestnut brown, with femur and tibia of hind leg lighter brown ; remainder of legs missing. Paratypes show front and middle legs similar to hind legs. Abdominal segments and hypopygium dark brown. Wing with brownish ground color, veins darker except at either side of junction of Rs with R_{4+5}, junction of r-m with M_{1+2}, and midlength of m-cu. Stigma slightly darker than ground color. Venation : Sc ending at origin of Rs ; Sc_1 1/2 length of Rs ; m-cu slightly before fork of M ; vein 2A slightly constricted toward 1A at level of arculus. Ninth tergum with two rows of thick, tuberculate setae along posterior edge. Outer gonostylus slender, slightly curved at outer 2/3 length, expanding slightly, then narrowing to acute tip. Inner gonostylus fleshy, rostral prolongation emerging near apex ; rostrum with one thick, elongate seta near base, another near apex.

Type material : holotype (male) : New Caledonia, Boulari River, XI-3-1958 (C. R. JOYCE), BPBM slide 2258 (wing and genitalia). Paratypes : New Caledonia : 1 male, Col d'Amieu, X-15-1978, (J. S. DUGDALE) ; Kwa Neie, X-4/13-1988, 480 m (J. CHAZEAU, C. D. HYNES) alcohol specimens ; 1 male, Mont Koghis, I-27-1963 (C. M. YOSHIMOTO, N. KRAUSS) ; 1 male, 1 female, Montagne des Sources, 166°36'18 " E, 2207' 02" S, XI-23-1988, 920 m (A. & S. TILLIER, S. LABARRE), alcohol specimen. Rivière Bleue : 1 male, III-27/IV-11-1986, 160 m ; 3 females, IV-23/V-9-1986, 150 m, slide 3105, 2 alcohol specimens ; 1 male, IV-23/V-9-1986, 150 m (L. BONNET DE LARBOGNE, J. CHAZEAU) ; 1 male, V-6/21-1987, 310 m (L. BONNET DE LARBOGNE, J. CHAZEAU, A. & S. TILLIER), alcohol specimens ; 4 males, 2 females, V-9/26-1986, 160 m ; 1 male, V-26/VI-6-1986, 150 m ; 4 males, V-26-/VI-6-1986, 160 m (L. BONNET DE LARBOGNE, J. CHAZEAU), 3 alcohol specimens and slide 3132 ; 1 male, VI-6/20-1986, 150 m (L. BONNET DE LARBOGNE, J. CHAZEAU, A. & S. TILLIER) ; 1 female, VI-6/20-1986, 160 m, slide 3106 ; 2 males, VI-20/VII-4-1986, 160 m (L. BONNET DE LARBOGNE, J. CHAZEAU), slides 2134, 3105 ; 1 male, VI-20/VII-4-1986 160 m (L. BONNET DE LARBOGNE, J. CHAZEAU, A. & S. TILLIER), slide 3104, one alcohol specimen ; 1 male, VIII-8/26-1987, 150 m (L. BONNET DE LARBOGNE, J. CHAZEAU) ; 1 male, VIII-1/19-1986, 150 m ; 1 male, IX-15/23-1986, 160 m (L. BONNET DE

Source : MNHN, Paris



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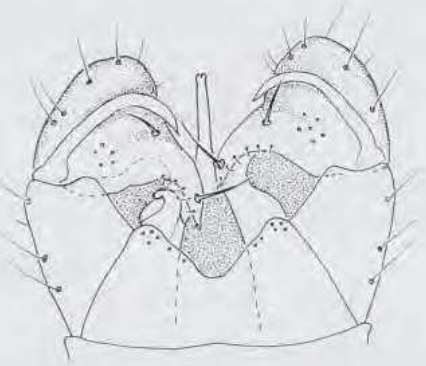

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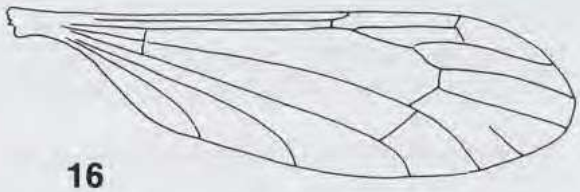

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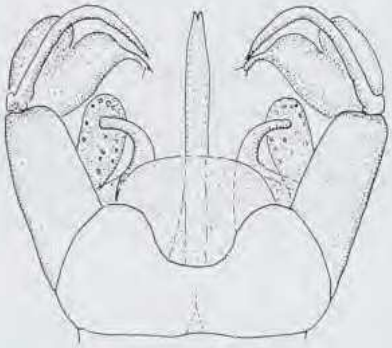

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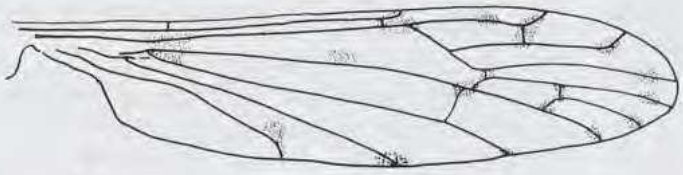

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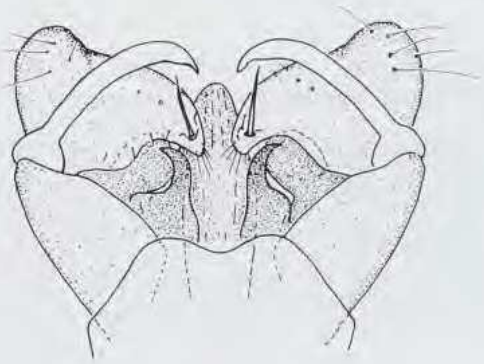

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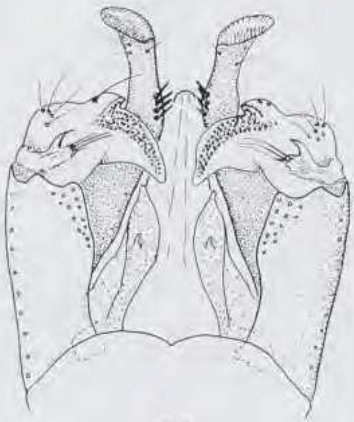

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FIGS. 14-20. — 14 : *Limonia (Dicranomyia) boulariensis* n. sp., wing ; 15 : *L.(D.) boulariensis* n. sp., hypopygium ; 16 : *L. (D.) chazeaui* n. sp., wing ; 17 : *L. (D.) chazeaui* n. sp., hypopygium ; 18 : *L. (D.) evenhuisi* n. sp., wing ; 19 : *L. (D.) evenhuisi* n. sp., hypopygium ; 20 : *Limonia (Libnotes) semieronis* Alex., hypopygium.

Source : MNHN, Paris

LARBOGNE, J. CHAZEAU, A. & S. TILLIER), slide 3107. The holotype is deposited in the BPBM. One paratype is deposited in the AMNZ and one in the NMNH. The remaining paratypes are deposited in the MNHN and in the BPBM.

Type locality : Boulari River.

Discussion : this species is allied to *Limonia (Dicranomyia) misera* (Riedel, 1921) from Papua New Guinea, and to *L. (D.) pectinunguis* Tokunaga, 1940 from Micronesia. The new species is readily separated by the incised 9th tergum and the coloration of the body especially the thorax and antennae.

Limonia (Dicranomyia) chazeaui n. sp.

(figs 16-17)

Description (male) : length 2.8 mm ; wing 3.7 mm. Vertex of head dark brown. Prescutum dark brown, remainder of thorax lighter to almost yellowish brown. Halteres light at base, grading to light brown at knobs. Abdominal segments 1 and 2 yellowish brown, others darker brown. Coxae, trochanters, and legs pale, almost white. Wing with brownish tinge, membrane appearing limp or wilted ; veins colorless, scarcely visible ; macrotrichia lacking on free tip of Sc_2 and R_2 ; veins R_3, R_{4+5}, M_{1+2}, M_3, M_4, and m-cu with numerous macrotrichia ; 1A and 2A with macrotrichia near edge of wing only. Venation : Sc_1 ending at or just before origin of Rs ; Sc_2 very hard to see but apparently subequal to Sc_1 ; vein M_3 about 1/4-1/5 length of M_{1+2}, suspended in membrane of wing with the basal portions of M_3 and m atrophied. Vein m-cu beyond fork of M. Hypopygium light yellowish brown ; median emargination of 9th tergum broadly U-shaped, lateral lobes rounded. Ventral gonostylus about 1/2 size of gonocoxite ; rostral prolongation robust with setae arranged as in fig. 17.

Type material : holotype (male) : New Caledonia, Rivière Bleue, v-6/21-1987, 170 m (L. BONNET DE LARBOGNE, J. CHAZEAU, A. & S. TILLIER), slide 3051. Paratypes : male, New Caledonia, Kwa Neie, x-4/13-1988, 460 m (J. CHAZEAU, C. D. HYNES). New Caledonia, Rivière Bleue : 1 female, IV-11/23-1986, 160 m (L. BONNET DE LARBOGNE, J. CHAZEAU) ; 2 males, v-6/21-1987, 170 m (L. BONNET DE LARBOGNE, J. CHAZEAU, A. & S. TILLIER) ; 1 male, VI-3/16-1987, 170 m (d°). The holotype and paratypes are deposited in the MNHN.

Type locality : Rivière Bleue, 170 m.

Derivatio nominis : this species is named in honor of J. CHAZEAU, for recognition of his work on the Rivière Bleue Project (ORSTOM, Nouméa).

Discussion : the only other regional species with the peculiar suspension of vein M_3 in the membrane of the wing is *Limonia (Dicranomyia) suspensa* Alexander, 1933, for which the type locality is Honshu, Japan. ALEXANDER inferred that *L. suspensa* was a marine crane-fly, which may explain why specimens taken by others from Fo'a, West Samoa, appear to be the same species (unpublished data). The specimens of *L. chazeaui* were taken from habitats along the Rivière Bleue in dense rain forest.

Limonia (Dicranomyia) collita Alexander

Limonia (Dicranomyia) collita Alexander, 1978a : 110 (male) (wing, hypopygium).

Records : Plateau de Dogny, II-4-1971, 150-900 m (NK) (NMNH) ; Boulari R., XI-17-1958 (CRJ) (BPBM) ; Col d'Amieu, XI-30-1983, 420 m (LM) (MNHN) ; Rivière Bleue, IV-19/22-1987, 310 m and V-6/21-1987, 310 m (LBL, JC, AT, ST) (MNHN).

Remark : ALEXANDER describes the holotype as having the pleura clear yellow, m-cu at fork of M. Specimens from the Rivière Bleue area have the pleura dark brown with a restricted pattern of yellow, and the vein m-cu before the fork of M. The genitalia of all specimens are similar.

Limonia (Dicranomyia) evenhuisi n. sp.

(figs 18-19)

Description (male) : length 4.5 mm ; wing 7.2 mm. Head with frons and vertex light gray, becoming brown at posterior vertex ; rostrum and palpi medium brown ; antennal scape light brown, pedicel and basal flagellar segments dark brown ; remainder of antennae broken. Pronotum brown. Mesonotal prescutum with 3 dark brown stripes, interspaces and prescutal pits reddish brown ; postscutal lobes black ; propleural plates covered with gray pruinosity. Halteres light

Source : MNHN, Paris

yellow, slightly darker at base and at base of knob. Coxae dark brown, trochanters lighter. Legs missing. Wings tinged with white, veins brown ; dark brown marks at arculus, tip of Sc, origin of Rs, r-m, fork of M, outer edge of cell 1st M_2, midlength R_1 at junction of R_1 with R_2 and free tip of Sc_1, and just before tips of all veins along outer margin of wing ; one dark brown spot in cell 1A adjoining 2A ; one spot at midlength of cell R on M. Venation : Sc_1 ending opposite origin of Rs, Sc_2 just before origin of Rs ; Rs slightly longer than basal section of R_{4+5} ; m-cu just before fork of M ; R_3 sharply bent at tip with a slight spur at angle ; 1A and 2A close and parallel at base, diverging markedly at midlength of 2A. Abdomen with terga mostly black, lighter reddish brown laterally and along posterior third ; sterna lighter yellowish brown to reddish brown. Male hypopygium with posterior border of 9th tergum only slightly emarginate, lateral lobes broad. Outer gonostylus gently curved to acute apex. Inner gonostylus short, rostral prolongation very thick at base with one elongate spine before apex. Parameres blackened, with the outer edge roughened by several very short, blunt protuberances, the outer end curved to an acute point.

Type material : holotype (male) : New Caledonia, Col d'Amieu, III-21-1968, 650 m (J. L. GRESSITT and T. C. MAA), BPBM slide 2265 (wing and genitalia). The holotype is deposited at the BPBM.

Type locality : Col d'Amieu, 650 m.

Derivatio nominis : I am naming this species after Neal EVENHUIS of the Bernice P. Bishop Museum.

Discussion : the venation and arrangement of the dark brown markings of the wing are almost precisely the same as found in *Limonia (Dicranomyia) fullawayi*, but the genitalia are different (see discussion below under that name).

Limonia (Dicranomyia) fijiana (Alexander)

Dicranomyia fijiana Alexander, 1924a : 36 (female).

Records : Fiji, Mount Evans, Lautoka, IV-11-1919 (WG) (BMNH) ; New Caledonia, Boulari R., XI-3-1958 (CRJ) (BPBM) ; Boulari R., XI-17-1958 (CRJ) (BPBM) ; La Crouen, III-20/22-1968, 150 m (JLG, TCM) (BPBM) ; Plaine des Lacs, XI-5-1958 (CRJ) (BPBM).

Limonia (Dicranomyia) fullawayi (Alexander)

Dicranomyia fullowayi Alexander, 1915c : 79 (male).
Limonia (Dicranomyia) fullowayi, Alexander, 1931 : 282 (male) (hypopygium).
Limonia (Dicranomyia) fullawayi, (Alexander), 1972 (emendation).

Records : Guam, Ladronas (DTF) (NMNH) ; New Caledonia, Col d'Amieu, X-15-1978, (JSD, KJF) (AMNZ) ; Mont Dzumac, V-16-1979 (PF) (MNHN) ; Forêt de la Thi, I-4-1979 (PF) (MNHN) ; Forêt de la Thi, VIII-7-1979, 100-300 m (GAS) (BPBM) ; Houailou River, X-26-1958 (CRJ) (BPBM) ; La Tontouta, IV-26-1979 (PF) (MNHN) ; Plum and Yaté [between ?], III-25-1968 (JLG, TCM) (BPBM) ; Mont Rembai, X-18-1978, 700 m (JSD) (AMNZ) ; Rivière Bleue, XI-11-1988, 170 m (JSD) (AMNZ). These are new records for New Caledonia.

Remarks : the three species above are in the "*punctulata*" group and are very difficult to separate. Moreover, there are a series of papers in which descriptions of the number and length of spines on the rostral prolongation of the ventral gonostylus will lead to confusion. In 1931, ALEXANDER compares *L. fullawayi* with species of the "*punctulata*" group and provides a drawing of the former species, in which the genitalia are not the same as shown in a later paper (1972). The major difference is that the rostral prolongation of the gonostylus (1972) has 2 short spines, while the earlier paper (1931) shows the rostrum with one elongate spine. Moreover, ALEXANDER (1935) describes the species *L. magnistyla* with 2 spines and later (1972) places it in synonymy with *L. fullawayi*. ALEXANDER's concept of *fullawayi* clearly includes the rostral prolongation having 2 short spines, and I am treating his 1931 paper as a case of mistaken identity. In New Caledonia, there are two forms in which body characters are extremely similar, except for the presence of one elongate rostral spine or two short ones. In one, the dorsal gonostylus, rostrum of the ventral gonostylus, and parameres are entirely different from the other members of the "*punctulata*" group which

Source : MNHN, Paris

have one spine and I have named this form as *L. (D.) evenhuisi*. Specimens of *L. fullawai* have the ventral gonostylus fleshy and elongate, with the rostral protrusion short and with 2 short, thick spinous setae near the apex. The dorsal gonostylus is abruptly thinner a short distance before the acute apex. The ventral gonostylus of *L. evenhuisi* is shorter with the rostrum much thicker at the base and with one elongate spine just before the apex. The dorsal gonostylus remains of relatively uniform thickness throughout its entire length to the acute apical point. The rostrum of the inner gonostylus is more like that of *L. (D.) guttula* Alexander and *L. (D.) torpida* Alexander of Papua New Guinea. The gonostylus is shorter and the rostrum thicker at the base in *L. (D.) evenhuisi* than in these species. I am unable to differentiate the females of these species.

Limonia (Dicranomyia) illingworthi (Alexander)

Dicranomyia illingworthi Alexander, 1914 : 239 (male).
Limonia (Dicranomyia) illingworthi Alexander, 1929 : 89 (male) (hypopygium).

Records : Nouméa, V-16-1928 (TDAC) (NMNH) ; Boulari, XI-17-1958 (CRJ) (BPBM) ; Bourail, V-27-1928 (TDAC) (NMNH) ; Dumbea River, X-28-1958 (CRJ) (BPBM) ; La Coulée, I-23-1963 (CMY) (BPBM) ; Nassirah, XI-10-1958 (CRJ) (BPBM) ; Nouméa, VII-6-VIII-23-1940 (FXW) (NMNH) ; Nouméa, VIII-9-1979, 5 m (WCG) (BPBM) ; Mont Do, XI-27-1983, 1000 m (LM, JC) (MNHN) ; Paita, II-10-1976, 0-100 m (NK) (BPBM) ; Plum and Yaté [between ?], III-25-1968 (JLG, TCM) (BPBM) ; Thio, XI-11-1958 (CRJ) (BPBM).

Remarks : ALEXANDER (1929k) discusses variations in wing spots. In another publication of the same year (1929), he drew the genitalia and discussed variations further. To this list of variations, one may add the presence of a dark spot on the arculus. There appears very little variation of the genitalia in all specimens.

Limonia (Dicranomyia) karma Alexander

Limonia (Dicranomyia) karma Alexander, 1948b : 376 (male) (wing, hypopygium).

Records : Mont Mou, XII-16-1945 (JCH) (NMNH).

Limonia (Dicranomyia) ovalistigma Alexander

Limonia (Dicranomyia) ovalistigma Alexander, 1951 : 587 (female).

Records : Mont Mou, I-1948, 315 m (900 ft) (LRG) (NMNH) ; La Crouen, III-20/22-1968, 150 m (JLG, TCM) (BPBM).

Limonia (Dicranomyia) pectinunguis Tokunaga

Limonia (Dicranomyia) pectinunguis Tokunaga, 1940 : 143 (male) (wing, hypopygium).
Limonia (Dicranomyia) neomisera Alexander, 1940 : 208 (male) (wing, hypopygium).

Records : Lelo, Kusaie, Caroline Is. ; Loyalty Is, Wé, Lifou I., II-16/18-1963 (CMY) (BPBM).

Limonia (Dicranomyia) perturbata Alexander

Limonia (Dicranomyia) perturbata Alexander, 1978a : 112 (male) (wing, hypopygium).

Records : Mont Mou, X-1947, 315 m (900 ft) (LRG) (NMNH) ; Col d'Amieu, X-15/17-1978 (JD) (AMNZ) ; Col d'Amieu, X-17/18-1978 (JSD) (AMNZ) ; Col d'Amieu, X-18/20-1978 (JSD) (AMNZ) ; Mont Koghis, I-27-1963 (CMY, NK) (BPBM) ; Kwa Neie, X-4/13-1988, 460 m (JC, CDH) (NMHN). Rivière Bleue : see below.

Remarks : the Rivière Bleue collections reveal that this species is present at all times of the year

Source : MNHN, Paris

in Station 5 and Station 6 with occasional records from Station 7. Significantly greater numbers of individuals are to be found in Station 6 with peak emergence occurring during the rainy season.

Limonia (Discobola) caledoniae Alexander

Limonia (Discobola) caledoniae Alexander, 1948a : 139 (male).

Records : Mont Mou, VI-1947, 315 m (900 ft) (LRG) (NMNH) ; Mont Panié, XII-1-1983, 100 m (LM) (MNHN) ; Rivière Bleue, III-12/27-1986, 160 m (LBL, JC, AT, ST) (MNHN).

Limonia (Doaneomyia) altitarsus caledoniensis Alexander

Limonia (Doaneomyia) altitarsus caledoniensis Alexander 1948b : 380 (male).

Records : La Foa, I-30-45 (CFR) (NMNH) ; Col de Petchécara, XII-1-1983, 100 m (LM) (MNHN) ; Col des Roussettes, II-4/6-1963, 450-550 m (JLG) (BPBM) ; La Foa, II-2/13-1945 (CFR) (NMNH) ; La Foa, IV-1-1945 (CFR) (NMNH) ; La Foa, IV-16-1945 (CFR) (NMNH) ; Mont Mou, XII-1-1988 (CDH) (MNHN).

Limonia (Doaneomyia) deprivata Alexander

Limonia (Doaneomyia) deprivata Alexander, 1948b : 380 (male).

Records : St. Louis, I-22-1946 (JCH) (NMNH) ; Forêt de la Thi, XI-18-1983, 150-250 m (LM) (MNHN) ; St. Louis, X-20-XI-11, 1945 (JCH) (NMNH) ; Tao River, IX-22-1988 (CDH) (MNHN).

Limonia (Geranomyia) circipunctata (Brunetti)

Geranomyia circipunctata Brunetti, 1912 : 390 (male).
Limonia (Geranomyia) circipunctata (Brunetti), Alexander, 1945 : 237.

Records : India, Calcutta, XII-7-1909 ; New Caledonia, Nouméa, VIII-23-1940 (FXW) (NMNH).

Limonia (Geranomyia) conjuratoides Alexander

Limonia (Geranomyia) conjuratoides Alexander, 1945 : 238 (male) (wing, hypopygium).

Records : Nouméa, VIII-23-1940 (FXW) (NMNH) ; La Foa, III-18-1940 (RCF) (NMNH) ; Ouano Beach, XI-13-1958 (CRJ) (BPBM).

Limonia (Goniodineura) apicifusca Alexander

Limonia (Goniodineura) apicifusca Alexander, 1978a : 114 (male) (wing, hypopygium).

Records : Hienghène, I-1970, 0-100 m (NK) (NMNH) ; Adio (Poya), forêt près grotte, III-8/15-1984 (JC) (MNHN).

Remark : this species has also been collected to the north of New Caledonia in Vanuatu, Espiritu Santo Is. : XII-1970 (NK) (NMNH) indicating that it is not endemic to New Caledonia.

Source : MNHN, Paris

Limonia (Idioglochina) tusitala novocaledonica Alexander

Limonia (Idioglochina) tusitala novocaledonica Alexander, 1929 : 90 (male).

Records : Ngo Bay, V-14-1928 (TDAC) (NMNH) ; Nakéty, X-9-1940 (FXW) (NMNH) ; Ponérihouen, III-24-1945 (CFR) (NMNH) ; Thio, XI-11-1958 (CRJ) (BPBM).

Limonia (Libnotes) notata solomonis (Alexander)

Libnotes solomonis Alexander, 1924a : 39 (male).
Limonia (Libnotes) solomonis, Alexander, 1940 : 200 (male).
Limonia (Libnotes) notata solomonis, Alexander, 1972 : 801.

Records : Solomon Islands, Guadalcanal, I-17/18-1921 (JAK) (BPBM) ; New Caledonia, Thi Valley, XI-8-1940 (FXW) (NMNH) ; St. Louis, I-22-1946, 1200 ft (H) (NMNH) ; La Foa, II-11/26-1945 (R) (NMNH).

Remarks : as ALEXANDER (1972) points out, the exact relationships of the species centering around *Limonia (Libnotes) notata* (van der Wulp, 1878) remain to be worked out. The species has been reported from New Caledonia (ALEXANDER, 1948b) with no subspecific designation. Though describing and mentioning other species (1972), in later papers, he makes no mention of the record. Moreover, he lowers *solomonis* to a subspecies of *notata*. I have few specimens for study and I am undecided about the problem. More specimens are needed. Since the subspecific designation indicates a difference in geographical area as well as description, I feel it best to leave the matter as above until more material is available.

Limonia (Libnotes) restricta (Alexander)

(fig. 21)

Libnotes restricta Alexander, 1924b : 366 (male).
Limonia (Libnotes) restricta, Alexander, 1978a : 119.

Records : La Crouen, III-12-1961 (JS) (BPBM) ; Forêt de la Thi, IV-4-1979 (PF) (MNHN) ; Forêt de la Thi, XI-28-1983, 150-250 m (LM) (MNHN) ; La Foa, IV-25-1945 (CFR) (NMNH) ; Mont Dore, V-10-1962 (JG) (MNHN) ; Mont Koghis, II-22-1973, 400-500 m (NK) (NMNH) ; Mont Koghis, XI-16-1983, 420-500 m (LM) (MNHN) ; Mont Koghis, XI-29-1963, 500 m (RS) (BPBM) ; Mont Mou, X-1949 (LEG) (NMNH) ; Nouméa, XI-19-1949, (LRG) (NMNH) ; Tiwaka (Poindimié), XI-23-1983, 20 m (LM) (MNHN) ; Yaté, IX-18-1988, 38 m (110 ft) (CDH) (MNHN) ; Yaté, XII-8-1983, (LM) (MNHN).

Remarks : ALEXANDER (1924b) described *Limonia (Libnotes) restricta*, from northern Australia, as having no brown marks on the veins. Later (1978a), he identified three males from New Caledonia as *L. restricta*, but indicated that they differed from the type in that the distal section of R_{4+5} and the bases of cells M, Cu, 1A, and 2A were suffused with brown along the veins. Alexander did not make a slide of the holotype. I received permission to make such a slide (CDH 4021), and am, thereby, able to show that these markings are also present on the holotype. The slide is deposited along with the holotype in the NMNH.

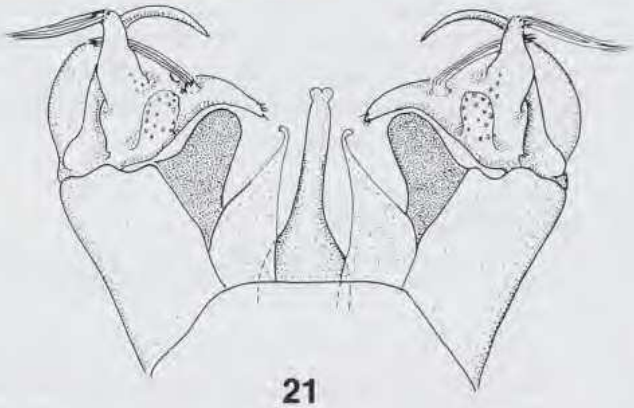
Limonia (Libnotes) semiermis (Alexander)

Limnobia semiermis Alexander, 1921 : 551.
Limonia (Libnotes) semiermis fasta Alexander, 1948b : 375 (male) (wing, hypopygium).

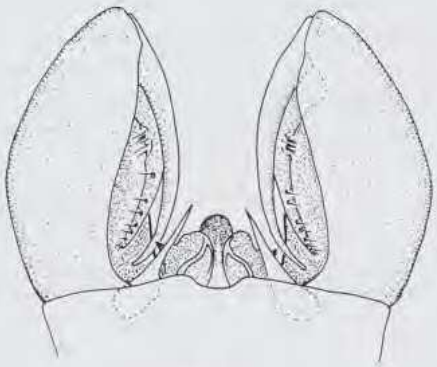
Records : St. Louis, X-20-1945, 420 m (1200 ft) (JCH) (NMNH) ; Ile des Pins, Kuto, VIII-17-1979, 0-5 m (WCG) (BPBM) ; Paita, IX-16-1945 (JCH) (NMNH) ; Rivière Bleue, VIII-1/14-1986, 170 m (LBL, JC, AT, ST) (MNHN) ; Rivière Bleue, IX-15/29-1986, 170 m (LBL, JC, AT, ST) (MNHN).

Remarks : ALEXANDER (1921) described *Limnobia semiermis* from North Queensland, Austra-

Source : MNHN, Paris



21



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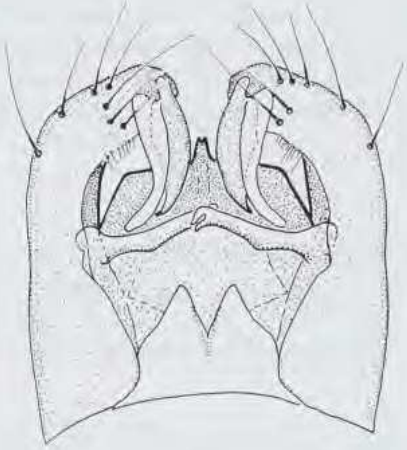

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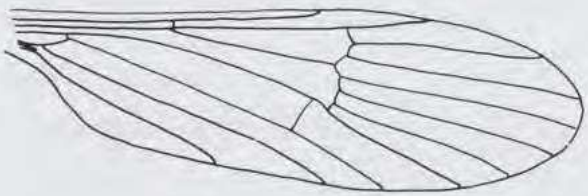
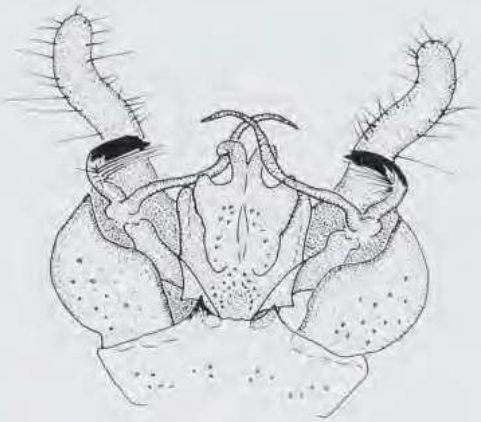
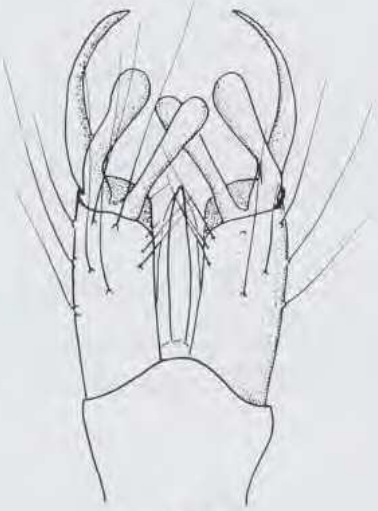


24



25



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FIGS 21-26. — 21 : *Limonia (Libnotes) restricta* Alex., hypopygium ; 22 : *Orimarga* (*Orimarga*) *risbeci* Alex., hypopygium ; 23 : *Epiphragma* (*Epiphragma*) *petulantia* Alex., hypopygium ; 24 : *Amphineurus* (*Amphineurus*) *koghiensis* n. sp., wing ; 25 : d°, hypopygium ; 26 : *Cheilotrichia* (*Empeda*) *caledonica* n. sp., hypopygium.

Source : MNHN, Paris

lia. The subspecies *fasta* was described in 1948 as indicated above. In 1971, ALEXANDER mentions races in New Caledonia. In reviewing the holotypes and comparing them to the specimens at hand I see no great differences between these specimens and the holotype of *semiermis*. Although the subspecies concept denotes a difference in geographical range, it should also reflect some descriptional difference. I see none so am dropping the subspecies name.

Limonia (Libnotes) trukensis Alexander

Limonia (Libnotes) trukensis Alexander, 1972 : 804 (male) (wing, hypopygium).

Records : Truk Is., Tol I., Mt. Unibote, XII-31-1952, 25-50 m (JLG) (NMNH). New Caledonia : Col des Roussettes, II-3-1971, 350-450 m (NK) (NMNH) ; Mont Koghis, XII-1-1963, 700 m (RS) (BPBM) ; Mont Mou, III-1949, 315 m (900 ft) (LRG) (NMNH) ; Mont Mou, XI-16-1983, 200-250 m (LM) (MNHN) ; Mont Rembai, X-17-1978, 700 m (JSD) (AMNZ) ; Tao, II-9-1963 (CMY) (BPBM) ; Yaté, IX-18-1988, 38 m (110 ft) (CDH) (MNHN).

Remark : the species centering around *Limonia (Libnotes) strigivena* (Walker) are closely related, as Alexander suggests. However, *L. (Libnotes) trukensis* does not vary much in terms of the spots on the wings and especially the details of the genitalia, e.g., the outer gonostylus, and is easily told from the other species.

Limonia (Limonia) hera Alexander

Limonia (Limonia) hera Alexander, 1948b : 373 (male) (wing, hypopygium).

Records : Paita, XI-16-1945 (JCH) (NMNH) ; Col d'Amieu, X-15/17-1978 (JD) (AMNZ) ; Col d'Amieu, X-20/21-1978 (JD) (AMNZ) ; Col d'Amieu, XI-29-1983, 380-430 m (LM) (MNHN) ; Forêt de la Thi, III-6-1960, 330 m (JLG) (BPBM) ; Kwa Neie, X-4/13-1988, 460 m (JC, CDH) (MNHN) ; Mont Koghis, I-27-1963 (CMY, NK) (BPBM) ; Mont Koghis, IX-30-1988, 304 m (1000') (CDH) (MNHN) ; Mont Koghis, XI-4-1963, 500 m (RS) (BPBM) ; Mont Koghis, XI-15-1983, 500-600 m (LM) (MNHN) ; Mont Koghis, XII-1-1963, 500-700 m (RS) (BPBM) ; Mont Koghis, XII-4-1963, 500 m (RS) (BPBM) ; Mont Koghis, XII-7/8-1963, 500 m (RS) (BPBM) ; Mont Mou, XII-6-1983, 150-250 m (LM) (MNHN) ; Plateau de Dogny, XI-20-1958 (CRJ) (BPBM) ; St. Louis, X-20-1945, 366 m (1200 ft) (JCH) (NMNH). Rivière Bleue : see below.

Remarks : the Rivière Bleue abundance profile indicates this species present as adults during the entire year. There are no peaks of emergence indicated.

Of dozens of specimens examined, three had the basal portion of M_3 atrophied (a male, both wings ; 1 female with both wings, 1 female, one wing). There are no differences in the genitalia of these specimens from the others.

Limonia (Limonia) mouicola Alexander

Limonia (Limonia) mouicola Alexander, 1948b : 372 (male) (wing, hypopygium).
Limonia (Limonia) paitae Alexander, 1948b : 374 (female), **n. syn.**

Records : Mont Mou, XII-16-1945, 1400 m (4000 ft) (JCH) (NMNH) ; Mont Koghis, I-27-1963 (CMY, NK) (BPBM) ; Mont Koghis, XI-30-1963, 600 m (RS) (BPBM) ; Paita, XI-16-1945 (JCH) (NMNH) ; Paita, I-27-1963 (CMY, NK) (BPBM) ; Rivière Bleue, II-20/III-2-1986, 160 m (LBL, JC) (MNHN) ; Rivière Bleue, III-27/IV-11-1986, 160 m (LBL, JC) (MNHN) ; VI-6/20-1986, 160 m (LBL, JC) (MNHN) ; VI-20/VII-4-1986, 160 m (LBL, JC, AT, ST) (MNHN) ; VI-16/VII-7-1987, 160 m (LBL, JC) (MNHN) ; XI-12/25-1986, 170 m (LBL, JC, AT, ST) (MNHN).

Remark : the description of *Limonia (L.) paitae* Alexander is based on a female specimen. The essential difference between this species and *L. (L.) mouicola* Alexander is the color of the pleuron. Coloration is quite variable in *L. moui-*

Source : MNHN, Paris

cola and overlaps that described for *paitae*. The location of the vein m-cu is also quite variable. The genitalia are essentially similar in all of the variants. With the number of specimens now available for *L. mouicola*, it is quite evident that *paitae* is a synonym of *mouicola*, the latter having page priority.

Limonia (Metalibnotes) caledoniana Alexander

Limonia (Metalibnotes) caledoniana Alexander, 1978a : 126 (male) (hypopygium).

Records : La Foa, II-15-1945 (CFR) (NMNH) ; Canala, près Col d'Amieu, XII-1-1983, 300-330 m (LM) (MNHN) ; Forêt de la Thi, I-4-1979, (PF) (MNHN) ; La Crouen, I-31-1963 (CMY) (BPBM) ; Mont Koghis, II-15-1963 (CMY) (BPBM) ; Plateau de Dogny, III-30-1968 (JLG) (BPBM) ; Plateau de Dogny, III-30-1968 (JLG) (BPBM) ; between Plum and Yaté, III-25-1968 (JLG, TCM) (BPBM) ; Rivière Bleue, III-27/IV-11-1986, 150 m (LBL, JC) (MNHN), and see below ; Tao, II-9-1963 (CMY, NK) (BPBM) ; Tao, II-8/10-1963, (CMY) (BPBM) ; Vallée d'Amoa, II-7-1963 (CMY) (BPBM).

Remarks : the Rivière Bleue abundance profile indicates this species as prevalent during all months of the year, especially at Station 6 (160 m). The population peaks during the rainy season (October through March).

A specimen from Tao has a cross-vein in cell R_3 on both wings. The genitalia appear to be precisely as described by Alexander.

Limonia (Nealexandriaria) ochricapilla Alexander

Limonia (Alexandriaria) ochricapilla Alexander, 1956 : 152 (female).
Limonia (Nealexandriaria) ochricapilla, Alexander, 1972 : 815.

Records : Fiji, Vanua Levu, I-21-1941 (OD) (BPBM). New Caledonia, Ouano Beach, XI-13-1958 (CRJ) (BPBM).

Remark : a male and female are the first records for the subgenus in New Caledonia. As indicated above, the species was first described from Fiji. Alexander (1972) indicates several other species as regional.

Limonia (Pseudoglochina) microneura Alexander

Limonia (Pseudoglochina) microneura Alexander, 1948b : 379 (male) (wing, hypopygium).

Records : Mont Mou, XII-16-1945, 1400 m (4000 ft) (JCH) (NMNH) ; Col d'Amieu, XII-12-1983, 300-350 m (LM) (MNHN) ; Rivière Bleue, III-27/IV-11-1986, 150 m (LBL, JC) (MNHN) ; Rivière Bleue, III-26/IV-9-1987, 150 m (LBL, JC, AT, ST) (MNHN) ; Rivière Bleue, IV-11/23-1986, 160 m (LBL, JC) (MNHN) ; Rivière Bleue, VI-20/VII-4-1986, 160 m (LBL, JC, AT, ST) (MNHN) ; Tao, cascades, X-20/XI-3-1988 (JC, AT, ST) (MNHN). Loyalty Is., Lifou I., Wé, II-16/18-1963 (CMY) (BPBM).

Remark : this is the only other record from the Loyalty Islands north of the main island. Further collecting on these islands would surely show more of the relationships to the entire archipelago.

Limonia (Thrypticomyia) basitarsatra Alexander

Limonia (Thrypticomyia) basitarsatra Alexander, 1948b : 378 (male) (wing, hypopygium).

Records : Paita, IX-16-1945 (JCH) (NMNH) ; Col d'Amieu, XI-29-1983, 380-470 m (LM) (MNHN) ; Forêt de la Thi, XI-18-1983, 150-250 m (LM) (MNHN) ; Mont Mou, IX-27-1988, 244 m (800 ft) (CDH) (MNHN) ; Paita, I-25-1963 (NK) (BPBM) ; Yahoué, II-20-1963 63 (CMY) (BPBM) ; Tao River,

Source : MNHN, Paris

IX-22-1988 (CDH) (MNHN) ; Rivière Bleue : see below.

Remark : the Rivière Bleue abundance profile indicates adults present the year around with no particular peaks of emergence.

Limonia (Thrypticomyia) subsaltens (Alexander)

Dicranomyia (Thrypticomyia) subsaltens Alexander, 1924a : 34 (male).
Thrypticomyia subsaltens, Edwards, 1928 : 77.
Limonia (Thrypticomyia) subsaltens, Alexander, 1929 : 88.

Records : Fiji, Lautoka, IV-22-1922 (WG) (BMNH). New Caledonia : Plum Farm, VI-7-1928 (TDAC) (NMNH) ; Nouméa, VIII-29-1940 (FXW) (NMNH).

Remark : EDWARDS (1928) also records this species from Samoa, which indicates that it may have a widespread distribution in the South Pacific.

Orimarga (Orimarga) risbeci Alexander

(fig. 22)

Orimarga (Orimarga) risbeci Alexander, 1934a : 328 (female) (wing).

Records : Plum Farm, I-1929 (JR) (NMNH) ; Boulari River, XI-3-1958 (CRJ) (BPBM) ; Col des Roussettes, II-4/6-1963, 450-550 m (JLG) (BPBM) ; Tiwaka (Poindimié), XI-22-1983, 20 m (JC, LM) (MNHN) ; Tiwaka (Poindimié), XI-23-1983, 2 m (LM) (MNHN) ; Tao River, IX-18-1988, 92 m (300 ft) (CDH) (MNHN).

Tribe *HEXATOMINI*

Epiphragma (Epiphragma) petulantia Alexander

(fig. 23)

Epiphragma (Epiphragma) petulantia Alexander, 1948b : 384 (male) (wing, genitalia).
Epiphragma (Epiphragma) legatoria Alexander, 1948b : 385 (male), **n. syn.**
Austrolimnophila (Austrolimnophila) caledoniana Alexander, 1971 : 308-309 (female) (wing), **n. syn.**

Records : St. Louis, XII-30-1945, 34 m (110 ft) (JCH) (NMNH) ; Col des Roussettes, II-4/6-1963, 450-550 m (CMY) (BPBM) ; Creek de Pierra (La Foa), XII-4-1983, 130 m (LM) (MNHN) ; Forêt de la Thi : VIII-10-1978, (PF) (MNHN) ; XI-28/XII-7-1983, 250 m (LM) (MNHN) ; Kwa Neie, X-4/13-1988, 460 m (JC, CDH) (MNHN) ; Mont Koghis : II-16-1963, 500 m (CMY) (BPBM) ; XII-2-1963, 500 m (RS) (BPBM) ; Mont Mou, II-1949, 315 m (900 ft) (LRG) (NMNH) ; I-1928, 275 m (900 ft) (LRG) (NMNH) ; II-1947, 315 m (900 ft) (LRG) (NMNH) ; IX-21-1988, 204 m (800') (CDH) (MNHN) ; XI-16-1983, 200-250 m (LM) (MNHN) ; IX-21-1988, 204 m (800') (CDH) (MNHN) ; XII-6-1983, 160-250 m (LM) (MNHN) ; Plateau de Dogny, XI-20-1958 (CRJ) (BPBM) ; St. Louis, I-22-1946, 366 m (1200 ft) (JCH) (NMNH) ; St. Louis Valley, VI-5-1945 (HEM) (BPBM) (MNHN) ; Rivière Bleue : IV-22/V-6-1987, 160 m (LBL, JC, AT, ST) ; V-21/VI-3-1987, 170 m (LBL, JC, AT, ST) ; IX-1/15-1986, 160 m (LBL, JC, AT, ST) (MNHN) ; IX-15/29-1986, 170 m (LBL, JC, AT, ST) (MNHN) ; X11/27-1988, 160 m (LBL, JC, AT, ST) (MNHN) ; St. Louis, XI-11-1946, 336-366 m (1100-1200 ft) (JCH) (NMNH).

Remark : a review of the holotypes of the above species along with the study of the materials collected in the Rivière Bleue area reveals that two of the three nominal species are based on variations of the same species, and that *Austrolimnophila* is no longer to be considered present on New Caledonia.

Source : MNHN, Paris

Epiphragma (Lipophragma) garrigoui (Alexander)

Austrolimnophila garrigoui Alexander, 1948a : 142 (female).
Epiphragma (Lipophragma) garrigoui Alexander, 1978a : 132 (allotype, male), new subgenus (hypopygium).

Records : Mont Mou, II-1947, 122 m (400 ft) (LRG) (NMNH) ; Forêt de la Thi, VIII-10-1978 (PF) (MNHN) ; Mont Koghis : XII-1-1963, 500-700 m (RS) (BPBM) ; XII-4-1963, 500-700 m (RS) (BPBM) ; Mont Mou, VII-1949, 315 m (900 ft) (LRG) (NMNH) ; Pouébo, II-3-1969, 20-100 m (RS) (BPBM) ; Rivière Bleue : see below.

Remarks : the Rivière Bleue abundance profile data indicate that specimens were found only at Stations 5 and 6. The specimens are distributed evenly over a 12-month period with no indication of a populational peak.

The species was originally described and placed in the genus *Austrolimnophila* (Alexander, 1948a). The presence of scales on the legs induced ALEXANDER to place the species in the genus *Epiphragma*, as the type of a new subgenus (1978a). This serves to indicate the close relationship of the two genera and the problem of separating them. Originally the genus included only those species in which there is a supernumerary vein in cell C. Only one of the specimens in my possession had even a suggestion of a supernumerary vein in cell C. Not mentioned by ALEXANDER is that in some individuals, the 2 terminal segments of the antennae may be bright yellow. Additionally, all coxae are yellow at the base, with a central dark brown band and white distal band ; the trochanters are yellowish brown.

Gynoplistia (Gynoplistia) basispinosa Alexander

Gynoplistia (Gynoplistia) basispinosa Alexander, 1978a : 133 (male) (wing, hypopygium).

Records : Hienghène, II-1971, 0-100 m (NK) (NMNH) ; Col d'Amieu, X-15-1978, (JSD) (AMNZ) ; Col d'Amieu, X-15/17-1978 (JSD) (AMNZ) ; Col d'Amieu, X-18/20-1978 (JSD) (AMNZ) ; Col d'Amieu, X-21-1978, 450 m (JSD) (AMNZ) ; Hienghène, I-1971, 0-10 m (NK) (BPBM) ; Koh, I-31-1963 (CMY) (BPBM) ; La Crouen, III-20/22-1968, 150 m (JLG, TCM) (BPBM) ; Ponérihouen, XI-25-1958 (CRJ) (BPBM) ; Pouébo, I-11-1964, 10 m (RS) (BPBM) ; Pouébo, I-17-1964, 150 m (JS) (BPBM) ; Pouébo, I-26/30-1964 (RS) (BPBM) ; Yiambi (Ignambi, misspelling), X-8-1967, 0-100 m (JS, MS) (BPBM) ; Yiambi (d°), X-15-1967, 1-50 m (JS, MS) (BPBM) ; Sarraméa, II-1971, 70-150 m (NK) (NMNH) ; Tao, X-20/XI-3-1988 (JC, AT, ST) (MNHN).

Gynoplistia (Gynoplistia) kraussiana Alexander

Gynoplistia (Gynoplistia) kraussiana Alexander, 1978b : 160 (male) (wing, hypopygium).

Records : Mont Koghis, II-23-1973, 400-500 m (NK) (NMNH) ; Mont Koghis, II-15-1963, 500 m (CMT) (BPBM) ; Mont Koghis, VIII-18-1968, 300 m (TCM, JLG) (BPBM) ; Mont Koghis, XII-1-1963, 500-700 m (RS) (BPBM) ; Mont Panié, II-8/9-1963 (CMY) (BPBM).

Remark : ALEXANDER describes the first abdominal segment as obscure orange. All specimens that I have observed, including the type, are brown with no orange overtone.

Gynoplistia (Gynoplistia) nigroventris Alexander

Gynoplistia (Gynoplistia) nigroventris Alexander, 1948b : 386 (female).

Records : St. Louis, I-1946,366 m (1200 ft) (JCH) (NMNH) ; Boulari R., XI-3-1958 (CRJ) (BPBM) ; Col d'Amieu, XI-29-1983, 380-470 m (LM) (MNHN) ; Forêt de la Thi, X-29/XI-1-1967 (JS, MS) (BPBM) ; Mont Koghis, I-27-1963 (CMY, NK) (BPBM) ; Mont Koghis, II-15-1963 (CMY) (BPBM) ; Mont Koghis, VIII-18-1968, 300 m (JLG, TCM) (BPBM).

Remarks : female specimens of all listed species of the genus and subgenus *Gynoplistia s. str.* have

Source : MNHN, Paris

variations in color and antennal formulae which overlap each other. ALEXANDER (1978b) indicates that the relatives of *G. nigroventris* are similar in details of color and hypopygial characters. No males of this species are known, and there is every possibility that the female is simply a variant of one of the other three species, most likely *G. kraussiana*.

Gynoplistia (Gynoplistia) williamsiana Alexander

Gynoplistia (Gynoplistia) williamsana Alexander, 1945 : 242 (male) (wing, hypopygium).

Records : Conception, XI-8/11-1944 (Wilfred) (NMNH) ; Adio (Poya), III-8/15-1984 (JC) (MNHN) ; Col des Roussettes, II-4/6-1963 (JLG) (BPBM) ; La Coulée (misspelled Couli), I-30-1963 (CMY) (BPBM) ; Dumbéa, X-14/29-1944 (WC) (NMNH) ; Forêt de la Thi, IV-01-1949 (PF) (MNHN) ; Forêt de la Thi, XI-18-1983, 150-250 m (LM) (MNHN) ; Kwa Neie, X-4/13-1988, 460 m (JC, CDH) (MNHN) ; La Crouen, III-20/22-1968, 180 m (JLG, TCM) (BPBM) ; Mont Chapeau Gendarme : VI-7-1944 (JCH) (NMNH) ; IX-13-1944 (JCH) (NMNH) ; XI-8-1944 (JCH) (NMNH) ; Mont Koghis, I-28-1983, 150-250 m (LM) (MNHN) ; Mont Koghis, II-15-1963, 500 m (CMY) (BPBM) ; IX-30-1988, 304 m (1000′) (CDH) (MNHN) ; X-4/6-1967, 450-600 m (JS, MS) (BPBM) ; X-9-1978, 500-550 m (JSD) (AMNZ) ; X-23/27-1967, 500-800 m (JS, MS) (BPBM) ; X-29/XI-1-1967 (JS, MS) (BPBM) ; Mont Mou, VI-1947, 315 m (900 ft) (LRG) (NMNH) ; Mont Panié, XI-2-1988, 1300 m (RR, TC) (MNHN) ; Nouméa, IX-10-1944 (LRG) (NMNH) ; Poindimié, I-1969, 0-50 m (NK) (BPBM) ; St. Louis Valley, III-22-1945 (HEM) (BPBM) ; Tao, II-9-1963 (CMY, NK) (BPBM) ; Tao, cascades, X-20/XI-3-1988 (JC, AT, ST) (MNHN) ; Thí River Valley, XI-6-1940 (FXW) ; Rivière Bleue : see below.

Remark : the Rivière Bleue abundance profile for this species indicates its prevalence as adults during the entire year, with no peaks of emergence.

Paralimnophila aurantionigra Alexander

Paralimnophila aurantionigra Alexander, 1978a : 133 (male) (wing, hypopygium).

Records : Sarraméa, II-1971, 70-100 m (NK) (NMNH) ; Mont Rembai, X-18-1978, 700 m (JSD, KJF) (AMNZ).

Paralimnophila caledonica (Alexander)

Gynoplistia (Paralimnophila) caledonica Alexander, 1948a : 143 (male).
Paralimnophila neocaledonica, Alexander, 1978a : 133.

Records : Mont Mou, IV-1947, 315 m (900 ft) (LRG) (NMNH) ; Boulari River, XI-3-1958 (CRJ) (BPBM).

Paralimnophila neocaledonica (Alexander)

Gynoplistia (Paralimnophila) neocaledonica Alexander, 1945 : 240 (male) (wing, hypopygium).
Paralimnophila neocaledonica, Alexander, 1978a : 133.

Records : Népoui Valley, VIII-1940 (FXW) (NMNH) ; Boulari R., XI-3-1958 (CRJ) (BPBM) ; Rivière Bleue, XI-11-1988, 170 m (JSD) (AMNZ) ; Tao River, IX-22-1988, 10 m (CDH) (MNHN).

Paralimnophila remingtoni (Alexander)

Gynoplistia (Paralimnophila) remingtoni Alexander, 1948a : 385 (female) ; 1948b : fig. 58-59 (male).
Paralimnophila remingtoni, Alexander, 1978a : 133.

Records : La Foa, IV-22-1945 (CFR) (NMNH) ; Mont Koghis, X-27-1967, 500 m (JS, MS) (BPBM) ;

Source : MNHN, Paris

Tao, cascade, x-20/xi-3-1988 (jc, at, st) (mnhn).

Remarks : Alexander (1959) discussed transfer of these and related species from *Papuaphila* to *Paralimnophila*. He later placed the group in the genus *Gynoplistia*, which indicates the close relationship of the group.

Alexander did not disclose why he reversed previous assertions and again raised *Paralimnophila* to generic rank. Where two closely related groups are involved and both the adult forms and the larval forms are easily separated from each other, the general practice has been to recognize the groups as separate genera. This practice is reasonable and biologically sound. I have larvae representing both genera in my collection of immatures. *Gynoplistia* and *Paralimnophila* have very similar limnophiline head capsules, which indicates their close relationship. The spiracular disks of species of *Paralimnophila* have long lobes which close upon themselves, whereas *Gynoplistia* species have rather squarish, truncated spiracular disks in which the lobes are unable to close on one another. Moreover, the habitat of the two genera is different. *Paralimnophila* is found mainly along the edges of creeks and rivers, while *Gynoplistia* is found principally in mats of leaf and twig accumulations. To bring consistency into the hierarchy, both should have full generic rank.

Tribe *Eriopterini*

Amphineurus (Amphineurus) koghiensis n. sp

(figs 24-25)

Description (male) : length 2.4 mm ; wing 3.7 mm. Female : length 2.7 mm ; wing 3.5 mm. Head brown, vertex darker ; rostrum and basal segment of palps brown, terminal segments darker ; antennal scape and pedicel yellow, flagellomeres dark brown, extreme bases of each segment lighter. Scutal lobes dark brown ; remainder of thorax, coxae, and trochanters reddish brown ; darker areas on propleura, anepisternum, and anterior anepimeron, producing a faint brown stripe. Halteres faint yellow at base, stems brown, knobs yellowish brown. Femora yellowish brown, tibiae and tarsi slightly darker. Wings opaque with light brownish yellow ground, veins forming cord, C, R, R_3, R_5, and Cu darker yellow along entire lengths. Macrotrichia sparse in cells, abundant along veins. Venation : Sc ending just before fork of Rs ; Sc_1 very long with Sc_2 at level of origin of Rs. R_2, R_{2+3}, R_{2+3+4}, basal section of R_5, and r-m, short and subequal in length ; m-cu about 1/2 its length before fork of M ; an element M_{1+2+3} present, subequal to M_{1+2}. Abdominal terga dull dark brown, sternites lighter. Ovipositor with both cerci and hypovalves short, curved upward, narrowing to acute tips ; base of cerci brown, tips yellow. Hypopygium yellow, posterior margin of 9th tergum transverse, with a short, triangular extension on either side of the midline. Gonocoxite bulbous, ventral mesal lobe a fleshy, finger-like projection subequal to length of basal portion ; medial lobe forming a dark plate, gently curved and serrate on its upper caudal edge. Inner gonostylus dark, the upper edge overlapping, forming a point at 2/3 length of style, apex of style obtuse, usually retracted beneath ninth tergum. Outer gonostylus with outer lobe flat, sharply curved mesad, middle of apex extended to point subtended by smaller points ; on inner surface a thick pencil of long, slender, closely appressed setae, projecting to apex of style ; inner arm very long, slender, twisted outward then curving cephalad to an acute point. Parameres forming a single sheet at base, dividing into two plates from each side of which projects a ventrally curved blade, obtuse at apex. Several rows of short, thick, spines on basal plate, inner rows directed caudad, outer rows directed cephalad. Aedeagus simple.

Type material : holotype (male) : New Caledonia, Route Canala apr. Col d'Amieu, 300-350 m, xii-12-1983 (L. Matile), slide 3049 (whole mount). Paratypes : 1 female, Mont Koghis, i-27-1963 (C. M. Yoshimoto and N. Krauss) ; 1 female, iii-7-1968, 300 m (J. L. Gressitt and T. C. Maa) (bpbm) ; 1 female, xii-1-1963, 500-700 m (R. Straatman) ; 2 females, xii-4-1963, 500 m (R. Straatman) ; 1 female, xii-2-1963, 500 m (R. Straatman) ; 1 male, Forêt de la Thi, iv-4-1979 (pf) (mnhn) ; 1 female, Pouébo, x-17-1964 (R. Straatman). Rivière Bleue, (all alcohol specimens) : 3 females, i-31/ii-12-1987, 160 m ; 1 male, 1 female, ii-25/iii-13-1987, 170 m ; 1 female, iii-27/iv-11-1986,150 m (L. Bonnet de Larbogne, J. Chazeau) ; 2 males, 2 females, iv-9/22-1987, 310 m ; 1 male, iv-9/22-1987, 170 m ; 5 males, 1 female, iv-22/v-6-1987, 170 m ; 2 males, 2 females, v-6/21-1987, 170 m ; 2 males, vi-3/16-1987, 170 m ; 1 female vi-20/vii-4-1986 150 m ; 1 male, 4 females ; vi-20/vii-4-1986, 160 m ; 3 males, vi-16/vii-7-1987, 170 m ; 1 female, viii-1/14-1986, 160 m ; 1 male, ix-1/15-1986, 160 m ; 1 male, ix-15/23-1986, 160 m ; 1 male, ix-15/29-1986, 170 m ; 1 male, ix-29/x-13-1986, 160 m ; 1 male, 1 female, ix-15/29-1986, 170 m (L. Bonnet de Larbogne, J. Chazeau, A. and S. Tillier) ;

Source : MNHN, Paris

1 female, XI-12/25-1986, 160 m (L. BONNET DE LARBOGNE, J. CHAZEAU). The holotype is deposited in the MNHN. One paratype is deposited in the NMNH, the remaining paratypes in the BPBM and MNHN.

Type locality : Route de Canala après le Col d'Amieu, 300-350 m.

Discussion : the genus *Amphineurus* Skuse is now represented by species in Australia, New Zealand, and southern South America, with one species, *A. (A.) polycyclus* Alexander (1961a), in Papua New Guinea. Unfortunately, the male of *A. polycyclus* is still unknown. The immature stages are similar to those of the genus *Ormosia* and are found in habitats indicated for *Styringomyia*.

Cheilotrichia (Empeda) caledonica n. sp.

(fig. 26)

Description (male) : length 2.5 mm ; wing 2.9 mm. Head and antennae chestnut brown ; rostrum and palps brownish orange. Pronotum yellow. Dorsum of mesothorax brown, except for a very noticeable yellow spot on posterior edge of each postscutal lobe. Paraterga yellow from pronotum to base of wing. Pleura mostly yellow with centers of all sclerites brown ; katepimeron and pterotergite gray pruinose. Halteres yellow, knobs orange. Minute scales on legs ; coxae yellow with medial areas brown, trochanters yellow ; femora yellow darkened at apex ; tibiae yellow, darkened at tip ; tarsi yellow, terminal segment of each dark brown. Wings tinged with yellow, veins brown. Venation : Sc ending opposite 1/4 of Rs ; R_2 and R_{2+3+4} subequal, latter only slightly larger than basal section of R_5 ; basal portion of M_{1+2} nearly lacking ; cell M_2 open by atrophy of m. Cell R_3 short, petiole longer than vein R_3 ; m-cu at or slightly before fork of M. Abdomen yellow, 8th segment slightly darkened ; hypopygium yellow, gonostylus slightly darker. Ventral gonostylus bifid, outer arm slender with acute tip, inner arm about 2/3 length of outer arm, expanded beyond midlength to form flat, paddle-shaped apex. Dorsal gonostylus with sides expanding slightly in apical 1/3 of length.

Type material : holotype (male) : New Caledonia, Mont Koghis, I-27-1963 (C. YOSHIMOTO and N. KRAUSS), BPBM slide 2259 (wings, leg, and genitalia). Paratypes : 1 female, same data as for the holotype ; 1 male, La Crouen, I-31-1963 (C. YOSHIMOTO and N. KRAUSS) ; 1 spec. (sex ?), Plaine des Lacs, XI-5-1958 (C. R. JOYCE) ; 1 spec. (sex ?), Houailou R., X-26-1958 (C. R. JOYCE). One paratype is deposited in the NMNH and one in the MNHN. The holotype and remaining paratypes are deposited in the BPBM.

Type locality : Mont Khogis.

Discussion : this is the first report of this genus and subgenus from New Caledonia. There are now eight forms of the subgenus in the Australasian region, the others being in Fiji, New Zealand, Papua New Guinea and Samoa.

Elephantomyia (Elephantomyia) garrigouana Alexander

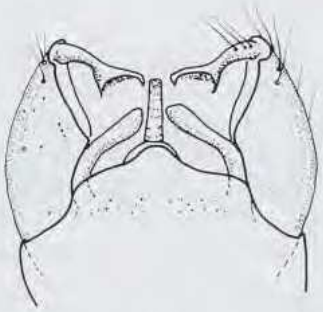
(fig. 27)

Elephantomyia (Elephantomyia) garrigouana Alexander, 1951 : 596 (male).

Records : Mont Mou, II-1949, 1220 m (4000 ft) (LRG) (NMNH) ; Mont Koghis, XII-4-1963, 500 m (RS) (BPBM) ; Mont Koghis, XII-2-1963, 500 m (RS) (BPBM) ; Mont Koghis, XII-4-1963, 500 m (RS) (BPBM) ; Mont Koghis, X-7/9-1978, 520 m (JSD) (AMNZ) ; Col des Roussettes, II-4/6-1963, 450-550 m (CMY, NK) ; Rivière Bleue : see below.

Remarks : the Rivière Bleue abundance profile for this species indicates that adults are present in every part of the year with no particular peaks of emergence. The immature stages were taken at Mont Mou, Kwa Neie, and Rivière Bleue. ALEXANDER distinctly and correctly indicates that this species has no tibial spurs, yet places it in the subgenus *Elephantomyia*. I am describing the immature stages, and their habitat in another paper which is in progress. Because the larval form is eriopterine in character, I am placing this genus in the tribe *Eriopterini*.

Source : MNHN, Paris



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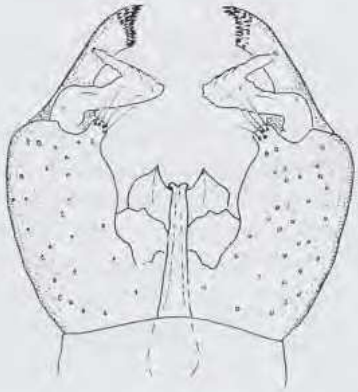

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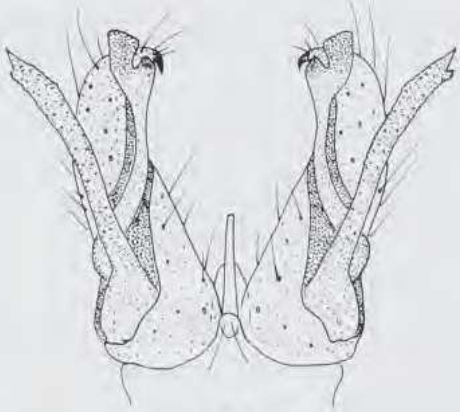

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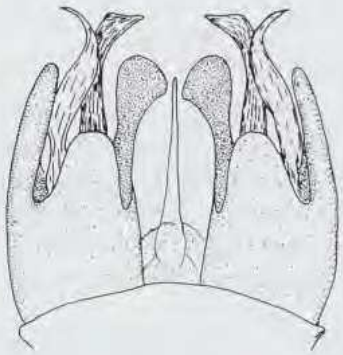

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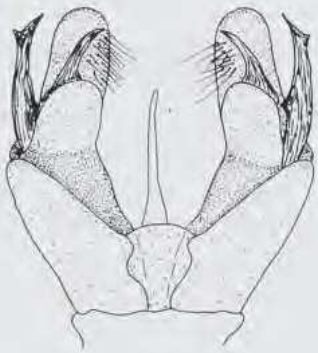

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FIGS 27-32. — 27 : *Elephantomyia* (*Elephantomyia*) *garrigouana* Alex., hypopygium ; 28 : *Erioptera* (*Ctenerioptera*) *caledonia* Alex., hypopygium ; 29 : *Gonomyia* (*Lipophleps*) *capnitis* Alex., hypopygium ; 30 : *Molophilus* (*Molophilus*) *amieuensis* n. sp., hypopygium ; 31 : *M. (M.) chazeaui* n. sp., hypopygium ; 32 : *M. (M.) mouensis* n. sp., hypopygium.

Source : MNHN, Paris

Erioptera (Ctenerioptera) caledonia Alexander

(fig. 28)

Erioptera (Meterioptera) caledonia Alexander, 1948a : 145 (female).

Records : Mont Mou, II-1947, 315 m (900 ft) (LRG) (NMNH) ; Nouméa (Anse Vata), XI-8-1958 (CRJ) (BPBM) ; Nouméa (Anse Vata), XI-16-1958 (CRJ) (BPBM) ; Bourail, II-4-1963 (NK) (BPBM) ; Col d'Amieu, X-20/21-1978, (JSD) (AMNZ) ; Forêt de la Thi, IV-4-1979 (PF) (MNHN) ; Forêt de la Thi, VIII-10-1978 (PF) (MNHN) ; Forêt de la Thi, XI-18/28-1983, 250 m (LM) (MNHN) ; La Crouen, I-31-1963 (CMY, NK) (BPBM) ; Mont Koghis, I-26/30-1963 (CMY, NK) (BPBM) ; Nouméa (Anse Vata), XI-8-1958 (CRJ) (BPBM) ; Rivière Bleue, VIII-9/26-1987, 150 m (LBL, JC) (MNHN) ; Tao, II-8/9-1963 (CMY, NK) (BPBM) ; Tao, II-9-1963 (CMY, NK) (BPBM) ; Tiwaka (Poindimié), XI-22-1983, 20 m (JC, DM, LM) (MNHN) ; Rivière Bleue : see below.

Remarks : the availability of larval forms indicates that the adult of this species is present during the entire year. The Rivière Bleue profile of abundance shows no indication of peak emergences during the year.

ALEXANDER described this species from a female. I am describing the male at this time so as to differentiate it from the other species of the South Pacific. The male genitalia indicate it should be placed in the subgenus *Ctenerioptera* (ALEXANDER, 1961b).

Male : length 3.2 mm ; wing 3.6 mm. Head yellow, brighter on frons and vertex ; antennae light brownish yellow, fusion segment of 3 basal flagellar segments ; palps brownish yellow. Pronotum and propleura brown. Mesonotum with brown medial stripe continued back to end of scutal lobes, interspaces and edge of prescutum yellow ; center of scutellum and postscutellum with broad brown stripe, edges yellow. Pleura gray-white pruinose, variegated with yellow. Halteres yellow, knobs darker. Coxae and trochanters yellowish brown, legs missing. Wing yellow with brownish tinge. Venation : Sc ending opposite 3/4 length of Rs ; Sc_2 ending just after origin of Rs. Abundant macrotrichia on all veins except basal 1/4 of R and basal 1/3 of M. Vein m-cu at or just before fork of M ; r-m in transverse alignment with basal section of R_5 ; R_{2+3+4} about 2 × R_{2+3}. Abdomen brownish yellow medially, with edges brighter yellow. Hypopygium yellow ; outer gonostylus as in subgenus with a double row of short, dark teeth at apex. Inner gonostylus narrow at base, widening to a slender blade, outer 1/3 narrowing to an elongate, darkened, spine, with acute tip. Phallosome broad, subtended by 2 broad, flat plates, with a strong medial ridge, coming to point at distal end of ridge.

Erioptera (Meterioptera) rhaphidostyla Alexander

Erioptera (Meterioptera) rhaphidostyla Alexander, 1978a : 136 (male) (wing, hypopygium).

Records : Col des Roussettes, II-3-1971, 350-450 m (NK) (NMNH) ; Adio, XII-13-1983, 160 m (LM) (MNHN) ; Bourail, II-4-1963 (CRJ) (BPBM) ; Canala, IX-22-1979, 0-5 m (WCG, GMN, GAS) (BPBM) ; Col d'Amieu, XI-30-1983, 420 m (LM) (MNHN) ; Forêt de la Thi, XI-28/XII-7-1983, 250 m (LM) (MNHN) ; Mont Koghis, IX-30-1988, 280 m (280 ft) (CDH) (MNHN) ; La Crouen, I-31-1963 (CMY, NK) (BPBM) ; La Foa, Creek de Pierra, XII-4-1983, 130 m (LM) (MNHN) ; Mont Mou, XI-16-1983, 200-250 m (LM) (MNHN) ; Pouébo, I-16-1964, 20 m (RS) (BPBM) ; Plateau de Dogny, XI-20-1958 (CRJ) (BPBM) ; Rivière Bleue, III-12-1986 (JC) (MNHN) ; Rivière Bleue, X-4-1988, 160 m (CDH) (MNHN) ; Tiwaka River, XI-27-1958 (CRJ) (BPBM) ; Rivière Bleue : see below.

Remark : the Rivière Bleue abundance profile and records of the immature stages of this species indicate adults are present the year around, with no peaks of emergence.

Source : MNHN, Paris

Erioptera (Trimicra) pilipes (Fabricius)

Tipula pilipes Fabricius, 1787 : 324 (male ?).
Erioptera (Trimicra) pilipes (Fabricius), Edwards, 1938 : 129.

Records : location of holotype unknown to me at this time. Nouméa, VII-VIII-1940 (FXW) (NMNH) ; Nouméa (Anse Vata), XI-8-1958 (CRJ) (BPBM) ; Nouméa (Anse Vata), XI-1-1958 (CRJ) (BPBM) ; St. Louis, X-4-1940 (FXW) (BPBM).

Remark : this ubiquitous species has been amply described. The many synonyms are given in two papers by ALEXANDER (1962a, 1962b).

Gonomyia (Gonomyia) herroni Alexander

Gonomyia (Gonomyia) herroni Alexander, 1948b : 388 (female).

Records : St. Louis, XI-11-1943, 366 m (1200 ft) (JCH) (NMNH) ; Col d'Amieu, XI-29-1983, 380-470 m (LM) (MNHN).

Gonomyia (Idiocera) cockerelli Alexander

Gonomyia (Ptilostena) cockerelli Alexander, 1929 : 91 (female).

Records : Ndji, Ile Ouen, VI-1928 (TDAC) (NMNH) ; Nouméa (Anse Vata), X-23-1958 (CRJ) (BPBM).

Remarks : this species was originally placed in a subgenus *Ptilostena* Bergroth (ALEXANDER, 1929). Later, *Ptilostena* was considered synonymous with the subgenus *Idiocera* (ALEXANDER, 1967n). This species has also been collected in Fiji to the east.

Gonomyia (Lipophleps) capnitis Alexander

(fig. 29)

Gonomyia (Lipophleps) capnitis Alexander, 1948b : 387 (male).

Records : La Foa, II-11-1945 (CFR) (NMNH) ; Bourail, II-4-1963 (CMY) (BPBM) ; La Foa, II-11/13-1945 (CFR) (NMNH) ; Mont Koghis, VIII-23/27-1967, 500 m (MS) (BPBM) ; Tontouta R., XI-7-1958 (CRJ) (BPBM).

Gonomyia (Lipophleps) novocaledoniae Alexander

Gonomyia (Lipophleps) novocaledoniae Alexander, 1945 : 243 (male) (wing, hypopygium).

Records : St. Louis, 1940 (FXW) (NMNH).

Gymnastes (Paragymnastes) dasycera Alexander

Gymnastes (Paragymnastes) dasycera Alexander, 1948b : 388 (male) (wing, hypopygium).

Records : Paita, IX-16-1945 (JCH) (NMNH) ; Col des Roussettes, II-4/6-1963, 450-550 m (CMY, NK) (BPBM) ; Kwa Neie, X-4/13-1988, 460 m (JC, CDH) (MNHN) ; Mont Do, forêt, XI-27-1983, 900-950 m (LM, JC) (MNHN) ; Mont Koghis : I-27-1983 (CMY, NK) (BPBM) ; XI-29-1963, 500 m (RS) (BPBM) ; XII-2-1963, 500 m (RS) (BPBM) ; XII-4-1963, 300 m (RA) (BPBM) ; Mont Mou : IX-15-1988, 280 m (800 ft) (CDH) (MNHN) ; XI-17-1988 160 m (CDH) (MNHN) ; Rivière Bleue, XI-17-1988, 160 m (CDH) (MNHN), and see below ; St. Louis, X-20-1945, 366 m (1200 ft) (JCH) (NMNH)

Remark : the Rivière Bleue profile of abundance and the information on the immature

Source : MNHN, Paris

stages for this species indicates the presence of adults at all times and at all stations, with the peak emergence from late September through March.

Gymnastes (Paragymnastes) niveipes Alexander

Gymnastes (Paragymnastes) niveipes Alexander, 1948b : 390 (male) (wing, hypopygium).

Records : St. Louis, IX-20-1945, 366 m (1200 ft) (JCH) (NMNH) ; Kwa Neie, X-4/13-1988, 460 m (JC, CDH) (MNHN) ; Mont Koghis, I-26/30-1963, 500 m (CMY, NK) (BPBM) ; Mont Koghis, XII-4-1963 (CMY, NK) (BPBM) ; Mont Kohgis, I-27-1963 (CMY) (BPBM) ; Mont Mou, forêt inf., bord ruiss., XII-6-1983 (LM) (MNHN) ; Rivière Bleue, X-4-1988, 160 m (CDH) (MNHN), and see below.

Remarks : the Rivière Bleue abundance profile and the information on the immature stages for this species indicates the presence of adults at all times and at all stations, with the peak emergence from late September through March.

Variation in coloration of the two species of *Gymnastes* listed above is remarkable. Especially is it true of *G. (P.) dasycera*. In both the males and females the stripes on the wings vary from deep color to that which is barely discernable. The physical structure of the males is constant, but in the females, which are very similar, it is quite difficult to tell lightly colored specimens of *G. dasycera* from those of *niveipes*. The only character which I have found to be at all useful is the tenth tergum which is yellow in the female of *niveipes* and which may be more darkly colored in the central area, but never totally dark as in the case of *dasycera*.

Molophilus (Molophilus) amieuensis n. sp.

(fig. 30)

Description (male) : length 2.1 mm ; wing 3.0 mm. Head, thorax, abdomen, coxae and trochanters reddish yellow. Legs pale whitish yellow, darker at tips of femora, tibiae, and last tarsal segment. Wings pale yellow, veins very light, barely perceptible. Venation : Sc_1 long, ending just before level of R_2, Sc_2 slightly beyond level of origin of Rs ; R_2 only shortly before level of r-m ; M_4 about 1 3/4-2 × petiole of cell M_3. Hypopygium yellow, with gonocoxite elongate, a recurved, sclerotized beak at apex. Outer gonostyla black, flattened, parallel sided blade, narrowing to acute point with small spine on lateral edge near tip. Inner gonostylus closely appressed to groove in gonocoxite, darkened at apex ; tip formed by two flattened arms with deep U-shaped notch between them, the outer arm slightly larger. Aedeagus slender, ending about midlength of gonocoxite.

Type material : holotype (male) : New Caledonia, Col de Ho, II-11-1963 (C. M. YOSHIMOTO and N. KRAUSS). Paratypes : 1 male, 9 km NE of Col d'Amieu, 600 m, IX-23-1979 (W. C. GAGNÉ), BPBM slide 2225 (genitalia) ; 1 female, Col des Roussettes, 300 m, II-5/6-1963 (C. M. YOSHIMOTO and N. KRAUSS). The holotype and female paratype are deposited in the BPBM. The male paratype is deposited in the NMNH.

Type locality : Col de Ho.

Molophilus (Molophilus) chazeaui n. sp.

(fig. 31)

Description (male) : length 2.0 mm ; wing 3.2 mm. General coloration brown. Coxae, trochanters, and base of femora yellowish brown, latter grading to brown at apex ; remainder of legs brown. Wings light brown with veins darker ; R, R_{1+2}, R_5, and Cu much darker. Venation : Sc ending at level of R_2 ; Sc_1 very long, Sc_2 about 1/5 length of Rs ; r-m very short, nearly absent ; first section of R_{4+5} slightly bent, not in straight line with Rs ; M_4 about 2 × M_{3+4} ; Rs bent at right angle just after origin, small spur at bend. Hypopygium with lateral lobe of gonocoxite finger-like ; ventral lobe elongate, expanded into a spatulate outer plate which is crenulate on inner edge, several elongate setae on outer edge (not shown on drawing). Basal or inner gonostylus parallel sided at base, becoming thinner and outwardly curved in distal 1/3, narrowing to an acute point ; outer gonostylus flat, sinuate blade becoming diagonally truncate at tip. Aedeagus simple, long, thin.

Type material : holotype (male) : New Caledonia, Mont Koghis, XI-30-1963, 600 m (R. STRAATMAN), BPBM slide 2257 (whole mount). Paratypes : 4 males, Mont Koghis, 304 m (1000') (C. D. HYNES). The holotype is deposited in the

Source : MNHN, Paris

BPBM, one paratype in the NMNH, and the remaining paratypes in the MNHN.

Type locality : Mont Khogis, 600 m.

Derivatio nominis : this species is named in honor of J. CHAZEAU.

Discussion : *Molophilus (M.) chazeaui* is characterized by the very strangely shaped ventral lobes of the gonocoxites, which are entirely different from those of any other species within the genus.

Molophilus (Molophilus) mouensis n. sp.

(fig. 32)

Description (male) : length 2.3 mm ; wing 3.8 mm. General color of head, thorax, and abdomen, dark brown. Antennae pale brown, short, reaching only slightly beyond wing base. Halteres with stems brown, knobs white. Coxae and trochanters pale brown, a dark brown spot over anterior junctions of coxae and trochanters, especially noticeable on hind pair. Femora and proximal portion of tibiae pale brown, becoming dark brown on tarsi. Remainder of legs broken. Wing with brownish tinge, veins about same color. Venation : Sc_1 ending just beyond level of R_2, Sc_2 slightly beyond level of origin of Rs ; R_2 just before level of r-m ; element R_{4+5} more than 2 × r-m ; M_4 3 × length of petiole of cell M_3. Hypopygium with ventral lobes of gonocoxite extended, thick, a patch of long setae on inner distal surface. Basal or outer gonostylus a flat blade, expanding slightly near midlength into a short, thick spine, narrowing with a short lateral spine near the acute tip. Inner gonostylus very thick at base narrowing abruptly to a gently curved rod, tip acute. Aedeagus elongate, thick at base narrowing to a slender tube ending just before level of lobe of gonocoxite.

Type material : holotype (male) : New Caledonia, forêt inf., Mont Mou, XII-6-1983, 160-250 m (L. MATILE). Paratypes : 1 male, same data as for holotype, slide 3037 (whole mount dissected) ; 4 males, same data as for holotype ; 1 male, New Caledonia, IX-20-1989, 280 m (800') (C. D. HYNES) ; 1 male, New Caledonia, IX-21-1989, 280 m (800') (C. D. HYNES) ; 2 males, Mont Mou, XII-6-1983, 200-250 m, (L. MATILE). The holotype is deposited in the MNHN, one paratype each in the NMNH and the BPBM, remaining paratypes in the MNHN.

Type locality : forêt inférieure du Mont Mou, 160-250 m.

Molophilus (Molophilus) ordinarius Alexander

Molophilus (Molophilus) ordinarius Alexander, 1948b : 391 (male) (hypopygium).

Records : Paita, IX-16-1945 (JCH) (NMNH). Col d'Amieu, 9 km NE, 600 m, IX-23-1979 (WCG) (BPBM) ; Col de Ho, II-11-1963 (CYM) (BPBM) ; Col de Mouirance (error for Mouirange), II-2-1963 (CMY, NK) (BPBM) ; Col de la Pirogue, II-14-1963, 330 m (CMY) (BPBM) ; Col des Roussettes, II-4/6-1963 (CMY, NK) (BPBM) ; Col des Roussettes, II-5/6-1963 (CMY, NK) (BPBM) ; Forêt de la Thi, VIII-10-1978 (PF) (MNHN) ; Koh, 10 km S, I-31-1963 (CMY) (BPBM) ; Mont Koghis, I-26/30-1963, 500 m (CMY, NK) (BPBM) ; Mont Koghis, II-15-1963, (CYM, NK) (BPBM) ; Mont Koghis, XII-2-1963, 500 m (RS) (BPBM) ; Mont Koghis, XII-4-1963, 500 m (RS) (BPBM) ; Mont Koghis, XII-7/8-1963, 500 m (RS) (BPBM) ; Nouméa, II-13-1963 (CMY, NK) (BPBM).

Molophilus (Molophilus) psephenus Alexander

(fig. 33)

Molophilus (Molophilus) psephenus Alexander, 1978a : 138 (male) (hypopygium).

Records : Col des Roussettes, II-3-1971, 107-137 m (350-450 ft) (NK) (NMNH) ; Col d'Amieu, XI-29-1983, 380-470 m (LM) (MNHN) ; Canala, IX-22-1979, 0-5 m (WCG, GMN, GAS) (BPBM) ; Forêt de la Thi, XI-28-1983, 150-250 m (LM) (MNHN) ; La Crouen, I-31-1963 (CMY, NK) (BPBM) ; La Crouen, III-20/22-1968, 150 m (JLG, TCM) (BPBM) ; Tao, cascades, X-20/XI-3-1988 (JC, AT, ST) (MNHN).

Source : MNHN, Paris

Molophilus (Molophilus) tartarus Alexander

(fig. 34)

Molophilus (Molophilus) tartarus Alexander, 1948b : 391 (male) (hypopygium).

Records : St. Louis, XI-11-1945, 31 m (100 ft) (JCH) (NMNH) ; Mont Mou, XII-6-1983, 160-250 m (LM) (MNHN) ; St. Louis, XI-4-1945 (JCH) (NMNH) ; St. Louis, Forêt de la Thi, VIII-7-1979, 100-300 m (GMN) (BPBM).

Molophilus (Molophilus) vorax Alexander

(fig. 35)

Molophilus (Molophilus) vorax Alexander, 1948a : 146 (male).

Records : Mont Mou, II-1947, 315 m (900 ft) (LRG) (NMNH) ; Mont Mou, III-1947 (LRG) (NMNH).

Remark : C. P. ALEXANDER did not illustrate the genitalia of this species. I am supplying a diagram of these at this time.

Molophilus (Molophilus) yoshimotoi n. sp.

(fig. 36)

Description : male : length 1.8 mm ; wing 2.6 mm. Female : length 2.0 mm ; wing 2.9 mm. Head pale brown, vertex darker ; rostrum pale brown, palpi darker ; antennal scape and pedicel pale brown to yellow, flagellomeres darker. Pronotum pale brown. Mesonotum pale brown along lateral edges, dark brown dorsally, extending back to mediotergite. Pleura dark brown, dorsal edge yellow, forming with pronotum, lateral edge of mesonotum, and base of wing, a yellowish stripe. Halteres pale yellowish white, brighter at base. Abdomen dark brown. Tenth tergum and ovipositor of female pale yellowish brown. Coxae and trochanters yellowish brown. Foreleg with femur and tibia dark brown, a small white ring at both base and tip. Tarsal segments dark brown, a white ring at tips of basal three segments. Middle and hind legs similar except no basal ring of white on femora. Tarsi of middle leg of holotype missing, but paratypes indicate these similar to other legs. Wing pale brown, veins and macrotrichia darker. Venation : Sc_1 long ending far beyond level of r-m, slightly beyond level of fork of Rs ; M_4 slightly more than 3 × petiole of cell M_3 ; element R_{4+5} about 2 × r-m. Hypopygium brown, with recurved beak of gonocoxite thick, surrounded by a concentration of small setae. Basal or outer gonostylus divided at apex into two equal arms, lateral arm slightly notched at tip. Inner gonostylus a straight rod, that narrows gradually to the tip, the inner margin and tip with more or less evenly spaced, very small, appressed spinulae.

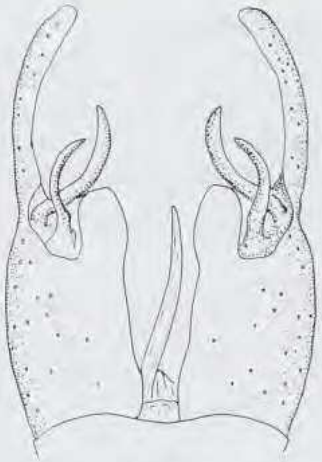
Type material : holotype (male) : New Caledonia, Col des Roussettes, 450-550 m, II-4/6-1963 (C. M. YOSHIMOTO, N. KRAUSS, J. L. GRESSITT), BPBM slide 2161. Allotype (female), same data as for holotype. Paratypes : 1 male, Col de Ho, II-11-1963 (C. YOSHIMOTO and N. KRAUSS) ; 1 male, Col de Mouirange, II-2-1963 (N. KRAUSS), BPBM slide 2153 ; 1 male, Col des Roussettes, II-4/6-1963, 450-550 m (J. L. GRESSITT, N. KRAUSS, C. M. YOSHIMOTO) ; 1 male, Forêt de la Thi, IV-4-1979 (P. FAURAN) ; 1 male, Forêt de la Thi, XI-28-1983, 150-250 m (L. MATILE) ; 1 male, Mont Do, XI-27-1983, 900-950 m (L. MATILE) ; 1 male, 5 females, Mont Koghis, X-7/9-1978, 520 m (J. S. DUGDALE) (AMNZ) slide 4018 ; 1 male, Mont Koghis, XI-15-1983, 500-600 m (L. MATILE) ; 1 male, Mont Koghis, IX-21-1979, 420 m (W. C. GAGNÉ, G. M. NISHIDA, G. A. SAMUELSON). The holotype, allotype, and some paratypes are deposited at the BPBM. Paratypes are also deposited in the MNHN and NMNH.

Type locality : Col des Roussettes, 450-550 m.

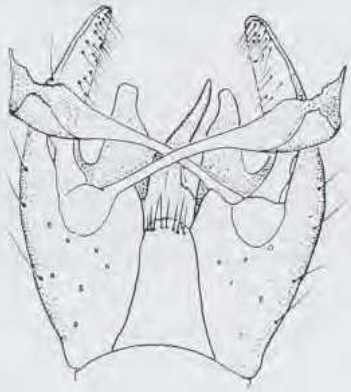
Discussion : my first identification of this specimen (HYNES, 1988) led me to believe that it represented an extension of the range of *Molophilus laevistylus* Alexander (1944), described from Australia. I have since been able to examine the holotype of this species, and there are no white rings on the legs.

The females of all species of *Molophilus* herein identified, are not separable on the characters which are used. The two species in which the females are easily identifiable are *M. ordinarius* Alexander, which is whitish yellow, as is the male, and *M. laevistylus* Alexander, which if the legs are present is easily identifiable.

Source : MNHN, Paris



33



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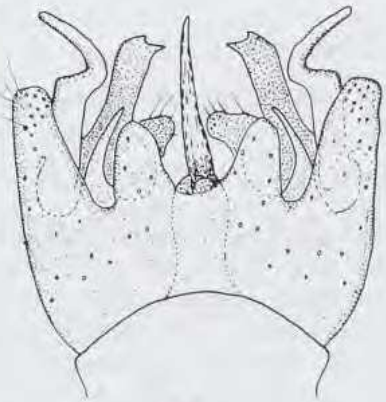

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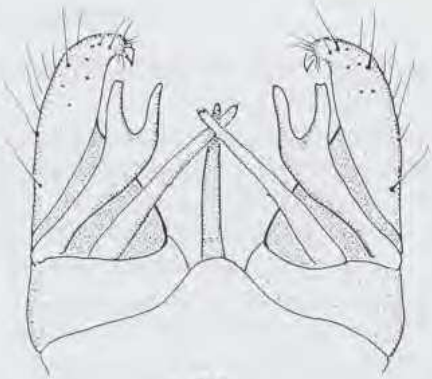

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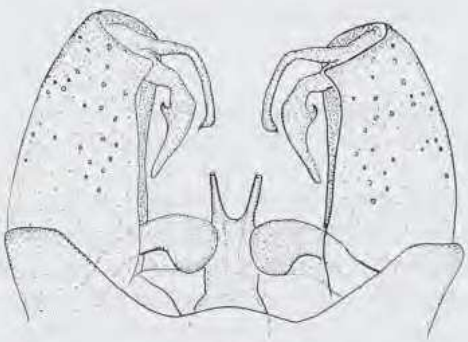
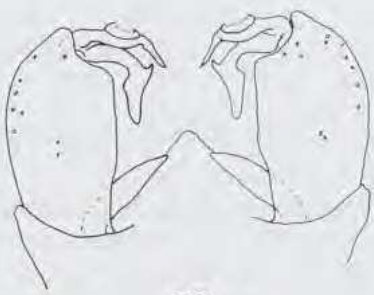


37



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FIGS 33-38. — 33 : *Molophilus* (*Molophilus*) *psephenus* Alex., hypopygium ; 34 : *M.* (*M.*) *tartarsus* Alex., hypopygium ; 35 : *M.* (*M.*) *vorax* Alex., hypopygium ; 36 : *M.* (*Molophilus*) *yoshimotoi* n. sp., hypopygium ; 37 : *Toxorhina* (*Ceratocheilus*) *caledonica* Alex., hypopygium ; 38 : *T.* (*C.*) *inobsepta* Alex., hypopygium.

Source : MNHN, Paris

Rhabdomastix (Sacandaga) austrocaledoniensis Alexander

Rhabdomastix austrocaledoniensis Alexander, 1948a : 144 (sex ?).

Records : Mont Mou, VI-1947, 336 m (1100 ft) (LRG) (NMNH) ; Col de Ho, II-11-1963 (CMY, NK) (BPBM) ; Col de Mouirange, II-2-1963 (CMY, NK) (BPBM) ; Col de la Pirogue, II-14-1963, 330 m (CMY, NK) (BPBM) ; Mont Mou, XII-6-1983, 160-250 m (LM) (MNHN).

Remark : the specimen collected by Loïc MATILE from Mont Mou was a male. Since this specimen has short antennae, it establishes *Sacandaga* as the subgenus of *Rhabdomastix* found in New Caledonia.

Styringomyia bidentata Hynes

Styringomyia bidentata Hynes, 1987 : 92 (male) (hypopygium).

Records : Mont Koghis, I-27-1963, (CMY, NK) (BPBM) ; Kwa Neie, X-4/13-1988, 460 m (JC, CDH) (MNHN).

Styringomyia neocaledoniae Alexander

Styringomyia neocaledoniae Alexander, 1948b : 392 (male) (wing, hypopygium).

Records : St. Louis, XI-11-1945 (JCH) (NMNH) ; Adio (Poya), forêt pr. grotte, III-8/15-1984 (JC) (MNHN) ; Col d'Amieu, X-15/17-1978 (JSD) (AMNZ) ; Col d'Amieu, X-16-1978 (JSD, KJF) (AMNZ) ; Col d'Amieu, X-17/18-1978 ; X-18/20-1978, (JSD) (AMNZ) ; Col d'Amieu, XI-29-1983, 380-470 m ; XII-1-1983, 200-230 m ; XII-12-1983, 300-350 m (LM) (MNHN) ; Mont Koghis, I-27-1963 (CMY, NK) (BPBM) ; Mont Koghis, IX-21-1979, (WCG, GMN, GAS) (BPBM) ; Mont Mou, IV-1947, 315 m (900 ft) (LRG) (NMNH) ; Mont Mou, XI-18-1983, 200-250 m (LM) (MNHN) ; Ouaco, X-20-1958 (CRJ) (BPBM) ; Yaté, ft. côtiere, XII-8-1983 (LM) (MNHN) ; Rivière Bleue : see below.

Remarks : the Rivière Bleue abundance profile, along with data from the collection of the immature stages (HYNES, 1990), indicates that adults of this species are present at all stations, year around, with peak emergence during late September through early June.

Many specimens of *Styringomyia bidentata* have probably been identified as *S. neocaledoniae* by mistake. The only way to be certain is to make slides of the hypopygia.

Toxorhina (Ceratocheilus) caledonica Alexander

(fig. 37)

Toxorhina (Ceratocheilus) caledonica Alexander, 1948a : 146 (female).

Records : Mont Mou, III-1947, 315 m (900 ft) (LRG) (NMNH) ; Col des Roussettes, II-4/6-1963, 450-550 m (CMY, NK, JLG) (BPBM) ; Forêt de la Thi, IV-1979 (PF) (MNHN) ; Col des Roussettes, II-4/6-1963, 450-550 m (CMY, NK, JLG) (BPBM) ; Kwa Neie, X-4/13-1988, 460 m (JC, CDH) (MNHN) ; Mont Koghis, XII-4-1963, 500 m (RS) ; Mont Mou, II-3-1963, 1200 m (CMY) (BPBM) ; Rivière Bleue : see below.

Remarks : the Rivière Bleue abundance profile indicates that the adults are present at all times of the year at all stations. The larval stages have been found and will be described in another paper.

The original description was based on a female specimen. The following is a description of the male.

Male : length, excluding rostrum, 4.1 mm ; wing, 4.4 mm ; rostrum about 4.9 mm., much shorter than on holotype. Coloration very simi-

Source : MNHN, Paris

lar in all respects to that described by Alexander (1948a) except abdomen does not show a yellow midline, but rather, yellow anteriorly and darker on the posterior 1/3 to 1/4 of the tergum. Hypopygium yellowish brown, details as indicated by fig. 37.

Toxorhina (Ceratocheilus) inobsepta Alexander

(fig. 38)

Toxorhina (Ceratocheilus) inobsepta Alexander, 1978a : 139 (female) (wing).

Records : Plateau de Dogny, II-4-1971, 53-315 m (150-900 ft) (NK) ; Col des Roussettes, II-4/6-1963, 450-550 m (CMY, NK, JLG) (BPBM) ; Mont Mou, II-3-1963, 1200 m (CMY) (BPBM) ; Mont Panié, XII-16-1983, 260-360 m (LM) (MNHN) ; Rivière Bleue, I-31/II-12-1987, 160 m (LBL, JC, AT, ST) (MNHN).

Remark : the original description was based on a female specimen. The male of this species agrees with the description of the holotype except for the following details :

Male : length, excluding rostrum, 4.0 mm ; wing, 4.2 mm ; rostrum about 5.3 mm. First abdominal and terminal terga dark brown, intermediate terga light brown bordered by dark brown on extreme caudal edge. Hypopygium yellowish brown, gonostyli as indicated in fig. 38.

Toxorhina (Ceratocheilus) juvenca Alexander

Toxorhina (Ceratocheilus) juvenca Alexander, 1948a : 147 (sex ?).

Records : Mont Mou, IV-1947, 315 m (900 ft) (LRG) (NMNH) ; Rivière Bleue, 1 male and 1 female, II-20/III-12-1986, 160 m (LBL, JC).

Remarks : ALEXANDER described *Toxorhina (Ceratocheilus) juvenca* from a broken specimen. J. CHAZEAU collected specimens of this species from the Rivière Bleue Project area at stations 5 and 6. After examining the type specimen now at the NMNH, I believe it was discolored at the time of description. Accordingly, I am rediscribing the female and including further information concerning the male.

Female : length not including rostrum, 5.7 mm ; wing, 4.4 mm ; rostrum 3.8 mm. Head gray, rostrum brownish with dark setae, no corniculus ; anterior vertex broad, about 4 × diameter of scape. Antennal scape, pedicel, and flagellomeres yellow. Pronotum yellow. Mesonotum brown medially, becoming yellow on lateral borders ; scutum, scutellum, and mediotergite light brown. Pleura yellow with dark brown stripe including cervical plate back to base of abdomen. Fore coxae and trochanters yellow ; remaining coxae and trochanters brownish yellow. Halteres with stem yellow, knobs brownish yellow. Legs yellow, femora and tibiae expanded at tips, covered with dark brown setae. Abdomen with terga brown, bordered by dark brown, sterna yellow ; valves and hypovalves yellow. Wing with arcular slightly depressed, forming pit, but not as deep as that in male. Venation same as in male, Sc_2 beyond origin of Rs ; M_{3+4} considerably shorter than M_4.

Male : length not including rostrum, 4.9 mm ; wing, 4.5 mm ; rostrum 3.8 mm. Head dark gray ; rostrum yellow, covered with dark setae. Antennae yellow, fusion segment apparently 4 segments. Pronotum yellow ; mesonotum brown medially, yellow laterally ; scutum, scutellum, and mediotergite brown. Pleura yellow, slightly darker beneath wing base. Fore coxae yellow, middle and hind coxae brownish yellow ; trochanters yellow ; legs yellow ; femora and tibiae expanded at tips. Halteres with stem yellow, knobs brownish yellow. Abdomen brown, sterna only slightly lighter, both sterna and terga bordered by dark brown ; hypopygium yellow, rotated. Ninth tergum medially extended, dark, truncate ; extreme edges of segment projecting caudad over gonocoxite. Wing with light brown tint, veins darker. Arculus extending laterad, forming large depressed pit, with elongate setae (about .7-8 mm. in length) lining ventral edges. Venation : Rs shorter than R_5 ; distance between R_2 and R_3 on costal border

Source : MNHN, Paris

greater than Rs; M_4 longer than M_{3+4} but shorter than M_3; m-cu just before fork of M. Macrotrichia on entire R_{4+5}, distal 2/3 of R_3, entire M_{1+2}, and distal portion of M_3.

Toxorhina (Eutoxorhina) parasimplex Hynes

Toxorhina (Eutoxorhina) parasimplex Hynes, 1987 : 335 (male).

Records : Col des Roussettes, II-4/6-1969, 450-550 m (JLG, CMY, NK) (BPBM); Col des Roussettes, II-4/6-1963, 450-550 m (JLG) (BPBM); Mont Panié, 11-16/XII.1983, 360 m (LM) (MNHN); Rivière Bleue, I-31/II-12-1987, 170 m (LBL, JC, AT, ST) (MNHN); Rivière Bleue, II-25/III-13-1987, 310 m (LBL, JC, AT, ST) (MNHN); Rivière Bleue, III-26/IV-9-1987, 310 m (LBL, JC, AT, ST) (MNHN); Rivière Bleue, IV-9/22-1987, 310 m (LBL, JC, AT, ST) (MNHN); IV-9/22-1987, 160 m (LBL, JC, AT, ST) (MNHN).

Remarks : in reviewing the original description of this species, I found a typographical error concerning the length of the antennae. This should read 0.53 mm, not 5.3 mm. I also find that the color of the thorax varies to a great extent. The holotype has a brownish cast, but in many of the specimens, the coloration is very much lighter to nearly yellow.

I am placing one specimen of this species as a "standard" in the NMNH.

KEY TO THE NEW CALEDONIAN TIPULIDAE

1. Terminal segment of maxillary palpus elongate; nasus usually distinct; Cu_1 often deflected at m-cu (Tipulinae) 2
— Terminal segment of maxillary palpus short; nasus lacking; Cu_1 never constricted at m-cu (Limoniinae) 14
2. Discal cell present 3
— Discal cell absent; vein M appears pectinate ..... ***Dolichopeza (D.) austrocaledonica*** Alex.
3. Antennae with some flagellar segments branched [*Ptilogyna (Plusiomyia)*] 4
— Flagellar segments not branched [*Leptotarsus (Macromastix)*] 6
4. Antennal segments 4-10 with 3 branches on each segment ..... ***Ptilogyna (P.) neocaledonica*** Alex.
— Antennal segments 4-10 with 2 branches on each segment 5
5. Scutellum brown ..... ***Ptilogyna (Plusiomyia) margaritae*** Alex.
— Scutellum strikingly gray to yellow medially, may be brown laterally ..... ***Ptilogyna (P.) herroni*** Alex.
6. Claws simple, without tooth 7
— Claws bidentate, with medial tooth 13
7. Hind tarsi, except for proximal half of basitarsus and last tarsal segment, white ..... ***Leptotarsus (M.) albipedis*** n. sp.
— Hind tarsi entirely brown 8
8. Antennae of male short, at most reaching back to or barely beyond base of wing 9
— Antennae of male long, extending well beyond base of wing 10

Source : MNHN, Paris

9. Gonostyle with 2 medially extended arms, virtually free of spines at ventral and outer edges; dark brown pattern of cell Sc and stigma separated by two yellow spots, one just beyond arculus, the other between end of Sc and stigma (male and female)..... ***Leptotarsus (M.) glabristylus*** n. sp.

— Gonostyle with 1 medially extended arm; spines at extreme..... ***Leptotarsus (M.) mixtus*** n. sp.

10. Gonostyles without medial arm or with only slightly extended arm from shaft ..... ***Leptotarsus (M.) risbeci*** Alex.

— Gonostyles with 1 or 2 arms extended mesad from stem or shaft of stylus..... 11

11. Gonostyles with 1 very short arm from basal shaft 12

— Gonostyles with 2 extended arms, ventral edge of outer arm lined with numerous short, dark spines ..... ***Leptotarsus (M.) spinastylus*** n. sp.

12. Abdominal terga uniformly brown ... ***Leptotarsus (M.) cockerellae*** Alex.

— Abdominal terga bicolorous..... ***Leptotartus (M.) caledoniana*** Alex.

13. Dark brown pattern of stigma and cell Sc separated by a yellow spot (males and females) ..... ***Leptotarsus (M.) noelianus*** Alex.

— Dark brown pattern of stigma and cell Sc not separated by yellow area ..... ***Leptotarsus (M.) novocaledonica*** Alex.

14. Free tip of Sc_2 often present nearly transversely oriented; R_4 and R_5 fused; only two branches of Rs (R_3 and R_{4+5}) present; antennae with 14 or 16 segments (*Limoniini*)..... 15

— Free tip of Sc_2 lacking; R_4 and R_5 separate; R_4 usually joined with R_{2+3} to form a distinct element R_{2+3+4} 51

15. R_2 lacking; antennae 16 segmented 16

— R_2 present; antennae 14 segmented 21

16. Three to four veins issuing from cell 1st M_2..... 17

— Five veins issuing from cell 1st M_2 ..... ***Helius (I.) pentaneura*** Alex.

17. Crossvein r-m connecting before fork of Rs; or, crossvein lacking, four veins issuing from cell 1st M_2 (separation of R_{4+5} from M_{1+2} after fork of Rs) 18

— Crossvein r-m connecting at or beyond fork of Rs..... 19

18. Rostrum elongate, about as long as or longer than thorax; wings patterned..... ***Helius (R.) matilei*** n. sp.

— Rostrum shorter, as long or slightly longer than head, but not as long as thorax; if present, wing pattern very light; stigma conspicuous when present ..... ***Helius (E.) mouensis*** Alex.

19. Head and body yellow; m-cu from just beyond to 1/3 its length beyond fork of M ..... ***Helius (H.) stolidus*** Alex.

— Head dark; black, gray, or brown 20

20. Wings not patterned; rostrum about 2 × head length, not as long as thorax; crossvein m-cu at or only slightly before fork of M ..... ***Helius (H.) neocaledonicus*** Alex.

Source : MNHN, Paris

— Wings patterned, one spot at origin of Rs and one at 1/3 to midlength cell R ; rostrum very long, about 1/3 remainder of body ; crossvein m-cu beyond fork of M ..... ***Helius (H.) aphrophilus*** Alex.

21. Crossvein m-cu much more than its own length before fork of M ..... ***Orimarga (O.) risbeci*** Alex.

— Crossvein m-cu never more than its own length before fork of M 22

22. One anal vein (1A) present or a very short 2A nearly fused to edge of wing 23

— Two anal veins present 24

23. Basitarsi white at base and tip, black between, remainder of tarsi white ..... ***Limonia (D.) deprivata*** Alex.

— Basitarsi and remainder of tarsi entirely white ..... ***Limonia (D.) altitarsus caledoniensis*** Alex.

24. Supernumerary crossvein present in cell 1A . ***Limonia (D.) caledoniae*** Alex.

— No crossveins in cell 1A 25

25. Mouth parts, especially labial palpi, lengthened, longer, than head 26

— Mouth parts, with labial palpi not notably lengthened, shorter than head 27

26. Ninth tergum (male) with lateral lobes produced ; tips of femora and tibiae not blackened ; R_1 unusually long ..... ***Limonia (G.) conjuratoides*** Alex.

— Ninth tergum (male) with lateral lobes not produced ; tips of femora and tibiae black ; edge of parameres serrulate ..... ***Limonia (G.) circipunctata*** Brunetti

27. Antennae with ventral face of flagellar segments produced to give a serrate appearance..... ***Limonia (I.) tusitata novocaledonica*** Alex.

— Antennae simple in both sexes..... 28

28. Wings cuneiform or petiolate at base..... 29

— Wings not cuneiform or petiolate at base 31

29. Cell 1st M_2 open by atrophy of M_3 ; cell 2A short to nearly lacking, in cases a mere thickening along anal margin of wing indicating presence of vein 2A ; rostral prolongation of ventral gonostylus with 2 spines ..... ***Limonia (P.) microneura*** Alex.

— Cell 1st M_2 closed ; vein 2A long ; microtrichia absent from of wing 30

30. Tibiae and most (7/8) of basitarsi black, remainder of tarsi white ; two rostral spines thick ; 3 strong setae directed caudad from each lobe of 9th tergum ..... ***Limonia (T.) basitarsatra*** Alex.

— Tibiae and basal 2/3-3/4 of basitarsi black, last four tarsal segments black, more extensive on hind legs ; rostral spines slender ..... ***Limonia (T.) subsaltens*** Alex.

31. Both Rs and R_{2+3} bent nearly at right angle ; Sc_1 nearly 1/2 length of Rs ; one spine on rostrum of gonostylus, near apex..... ***Limonia (G.) apicifusca*** Alex.

— Rs not bent at right angle, or if angulated, not coincidentally with R_{2+3}..... 32

Source : MNHN, Paris

32. Eyes virtually holoptic ..... ***Limonia (A.) taoensis*** n. sp.
— Eyes not holoptic 33
33. Sc relatively short, ending opposite or before origin of Rs ; if ending beyond origin of Rs, then male hypopygium with 2 gonostyli 34
— Sc ending beyond origin of Rs ; one gonostylus, or if two, outer gonostylus divided 45
34. Only 2 branches of M reaching wing margin ..... ***Limonia (N.) ochricapilla*** Alex.
— Three branches of M reaching wing margin (including M_3 suspended in membrane) 35
35. Crossvein m-cu beyond fork of M 36
— Crossvein m-cu just before, at or if beyond, near fork of M 37
36. Vein m and basal portion of M_3 atrophied, distal portion of M_3 suspended in membrane ..... ***Limonia (D.) chazeaui*** n. sp.
— Vein m and M_3 not as above ; m-cu about 1/4 or more length of cell 1st M_2 from its base ; wings marked only at stigma ; extreme dorsal edge of pleura and ventral edge of prescutum forming a conspicuous yellow stripe ; another stripe from fore coxa to base of abdomen ; rostral prolongation of ventral gonostylus with 2 spines, inner spine thicker ..... ***Limonia (D.) perturbata*** Alex.
37. Wings not marked with brown, or marked only at stigma 38
— Wings marked with brown on more than stigma 40
38. Sc_1 long, nearly 1/2 Rs ; Sc_2 well before origin of Rs ; rostrum of gonostylus with two long spines before apex 39
— Sc_1 short, Sc_2 near or at tip of Sc_1, both beyond origin of Rs ; rostrum of gonostylus with two very thick spines at apex ..... ***Limonia (D.) ovalistigma*** Alex.
39. Cell M_2 closed ..... ***Limonia (D.) collita*** Alex.
— Cell M_2 open by atrophy of m. ..... ***Limonia (D.) boulariensis*** n. sp.
40. Vein 2A bent or curved strongly (nearly right angle) to wing margin ; dark clouds at tip of R_3, fork of Sc, at 1/3 length of cell R from base, and arculus ..... ***Limonia (D.) agape*** Alex.
— Vein 2A not as above 41
41. Wings with definite spot near or at end of vein 2A (*punctulata* group) 42
— Wings without such markings at end of vein 2A 44
42. Two brown marks in cell R, not counting arculus ; one each in cells R_3, R_5, 2nd M_2, and M_3 ..... ***Limonia (D.) fijiana*** Alex.
— Only one brown mark in cell R, not counting arculus 43
43. Rostrum of inner gonostylus with 2 short, thick spines near apex .... ***Limonia (D.) fullawayi*** Alex.
— Rostrum of inner gonostylus with one elongate spine near apex .... ***Limonia (D.) evenhuisi*** n. sp.
44. Vein R_{4+5} weakly angulated and spurred at near 1/3 length ; antennae (male) long, exceeding 1/2 length of wing ; Sc_1 at origin of Rs, Sc_2 well before origin of Rs ..... ***Limonia (D.) karma*** Alex.

Source : MNHN, Paris

— Vein R_{4+5} not as above, cell R_3 much wider basally than at midlength, narrowing at about 2/3 length of cell from base; antennae not elongate; m-cu 2/3 to 3/4 its length before fork of M ..... ***Limonia (D.) illingworthi*** Alex.

45. Branches of R strongly deflected at outer ends.....48
— Branches of R not as above..... 46

46. Gonocoxite elongated ventrally; stigma long, oval in male; wings with dark veins and a small cloud at origin of Rs ..... ***Limonia (M.) caledoniana*** Alex.
— Gonocoxite not as above..... 47

47. A single gonostylus present; anal veins close and nearly parallel at base; free tip of Sc_2 subequal to R_2; crossvein m-cu at fork of M ... ***Limonia (L.) hera*** Alex.
— Two gonostyli present; anal veins divergent at base; free tip of Sc_2 much longer than R_2; m-cu joining M_{3+4} about 1/4 or more length of cell 1st M_2 from its base; rostrum of gonostylus with two setae coming off one large, basal tubercle..... ***Limonia (L.) mouicola*** Alex.

48. Gonocoxite extending caudally; R_2 bent (in cases, only very slightly) at about 1/4 length from Sc_2..... ***Limonia (Lib.) semiermis*** Alex.
— Gonocoxite and vein R_2 not as above..... 49

49. Wing with darkened spots on veins; M_{3+4} much longer than M_4 50
— Wings without darkened spots on veins; M_{3+4} and M_4 subequal in length..... ***Limonia (Lib.) notata solomonis*** Alex.

50. Veins R_{4+5} and basal 3/4 of Cu dark brown. ***Limonia (Lib.) restricta*** Alex.
— Veins R_{4+5} and base of Cu not dark brown; no spots at end of veins R_{2+3} and R_{4+5} ..... ***Limonia (Lib.) trukensis*** Alex.

51. Tibial spurs present..... 52
— Tibial spurs absent..... 61

52. Vein 2A not sinuous; anterior branch of Media (arculus) present; antennae never pectinate 53
— Vein 2A sinuous; anterior branch of Media (arculus) absent; antennae pectinate on some specimens..... 54

53. First three flagellomeres yellow; abundant elongate scales on legs, especially at base of femur; femora with three yellow rings ..... ***Epiphragma (Lip.) garrigoui*** Alex.
— Only first flagellomere yellow; no elongate scales on legs; no yellow rings on femora ..... ***Epiphragma (E.) petulantia*** Alex.

54. Antennae pectinate, basal segments of flagellum not enlarged at apex [*Gynoplistia (Gynoplistia)*] 58
— Antennae not pectinate, basal segments of flagellum enlarged at apex (*Paralimnophila*)..... 55

55. Wings with dark brown spots in cells... ***Paralimnophila remingtoni*** Alex.
— Wings without dark brown spots in cells..... 56

56. Femora dark brown; wings dark brown ..... ***Paralimnophila aurantionigra*** Alex.
— Femora yellowish, with dark brown terminal rings..... 57

Source : MNHN, Paris

57. Cell R_3 less than three times as wide as cell R_2 at wing margin ; at distal end of femora with a terminal and subterminal dark ring separated by yellow ring ..... ***Paralimnophila caledonica*** Alex.

— Cell R_3 at least 4 times or more as wide as cell R_2 at wing margin ; femorae and tibiae brownish yellow, tips narrowly blackened .... ***Paralimnophila neocaledonica*** Alex.

58. Abdominal segments 2-9 brown or brownish black (female ; male unknown) ..... ***Gynoplistia (G.) nigroventris*** Alex.

— Some abdominal segments (2-9) not black 59

59. Parameres with large spine near midlength of shaft ; abdominal segments 1-5 orange, 6-7 black, 8-9 orange ; r-m variable sometimes nearly lacking ; femora brownish black..... ..... ***Gynoplistia (G.) basispinosa*** Alex.

— Parameres simple, no spine on shaft..... 60

60. Inner gonostylus slightly recurved with 2-3 setae near apex ; cell R_3 less than 2 × width of cell R_2 at margin ; abdominal segment 1 orange, 2-3 (in cases 2-4) orange with black ring, 4-5 orange (in cases 1-4 virtually black, only 5 orange), 6-7 black, 8-9 orange ; the basal 1/2 of the fore femora obscure yellow, distal 1/2 blackened ; male and female claws with row of denticles at base..... ***Gynoplistia (G.) williamsiana*** Alex.

— Inner gonostylus with three points at tip, two quite close together ; abdominal segments 2-7 brownish yellow anteriorly, black caudally, segment 8 black, segment 9 yellow ; femora yellow, apical 1/5 blackened..... ***Gynoplistia (G.) kraussiana*** Alex.

61. Setae on femora forked (*Toxorhina*)..... 62

— Setae on femora not forked..... 65

62. Wings with two branches of Rs reaching margin..... 63

— Wings with one branch of Rs reaching margin .... ***Toxorhina (E.) parasimplex*** Hynes

63. Cell M_2 open by atrophy of m ..... ***Toxorhina (C.) inobsepta*** Alex.

— Cell M_2 closed 64

64. A shallow, elongate pit fringed with elongate setae just beyond arculus of wing (area smaller in female) ; no yellow cross-band on abdomen ; abdominal segments brown ; halteres with at least stem brown..... ..... ***Toxorhina (C.) juvenca*** Alex.

— No fringed pit present on wing of males or females ; in cases, abdominal segments with yellowish cross-band ; halteres yellow .... ***Toxorhina (C.) caledonica*** Alex.

65. Rostrum elongate, equal to or nearly equal to length of body ; tarsi white..... ***Elephantomyia (E.) garrigouana*** Alex.

— Rostrum short, not elongate 66

66. Vein R_1 and R_{2+3} end before midlength of costal margin..... 67

— Vein R_1 and other branchs of radius reach wing margin beyond midlength of wing 68

67. Basal arm of gonostylus blade-like, serrated on inner margin, apex pointed..... ***Styringomyia neocaledoniae*** Alex.

Source : MNHN, Paris

— Basal arm of gonostylus rod-like, apex bidentate, ends blunt ..... ***Styringomyia bidentata*** Hynes

68. Cell R_3 sessile, or if only nearly so, then lateral lobe of gonocoxite elongate (*Molophilus*) 69
— Cell R_3 not sessile 76

69. Lateral lobe of gonocoxite with strong beak at apex 70
— Lateral lobe of gonocoxite without beak at apex 72

70. Arms of basal or inner gonostylus elongate, reaching beyond apex of lobes of gonocoxite; gonostylus dentate at apices; M_4 about 3 × petiole of cell M_3 ..... ***Molophilus (M.) amieuensis*** n. sp.
— Arms of basal or inner gonostylus shorter, not reaching outer end of gonocoxite 71

71. General coloration pale yellow to yellowish white; gonostylus yellow or only slightly darkened; lateral lobe of outer gonostylus not notched ..... ***Molophilus (M.) ordinarius*** Alex.
— General coloration reddish brown; femora with noticeable white bands at base and tip; gonostylus dark brown to black; vein M_4 2 1/3 × petiole of cell M_3 or longer ..... ***Molophilus (M.) yoshimotoi*** n. sp.

72. Distal end of ventral lobe of gonocoxite spatulate; M_4 2 1/4 × petiole of cell M_3 ..... ***Molophilus (M.) chazeaui*** n. sp.
— Ventral lobe not as above 73

73. Dorsal lobe of gonocoxite ending in an elongate spine ..... ***Molophilus (M.) vorax*** Alex.
— Dorsal lobe not as above 74

74. Lateral lobe of gonocoxite elongate, finger-like; M_4 barely 2 × petiole of cell M_3 ..... ***Molophilus (M.) psephenus*** Alex.
— Lateral lobe not as above 75

75. Basal or inner gonostylus elongate, reaching beyond tip of gonocoxite; distal ends with a long, laterally directed point; distal end with edges serrate; M_4 nearly 2 1/2 × petiole of cell M_3 ..... ***Molophilus (M.) tartarus*** Alex.
— Basal or inner gonostylus short, expanding into a widened point near midlength, with one subterminal spine .. ***Molophilus (M.) mouensis*** n. sp.

76. Wings with cell R_3 short; petiole of cell R_3 subequal to or longer than vein R_3 77
— Wings with cell R_3 long; petiole much shorter than vein R_3 84

77. Legs, especially the femur, with numerous, flattened scales 78
— Legs without scales 80

78. Vein R_2 present ..... ***Cheilotrichia (E.) caledonica*** n. sp.
— Vein R_2 absent 79

79. Wings lightly to heavily patterned; ninth sternum produced, terminating in a disk-like tip; tarsi dark or black ..... ***Gymnastes (P.) dasycera*** Alex.
— Wings not patterned; ninth sternum not produced; tarsi sometimes white, in cases with tibia having subterminal white ring before terminal black ring, basitarsi mostly white ..... ***Gymnastes (P.) niveipes*** Alex.

Source : MNHN, Paris

80. Wings with Sc long, Sc_1 ending well beyond origin of Rs ..... ***Rhabdomastix (S.) austrocaledoniensis*** Alex.
— Wings with Sc short, Sc_1 ending near or before origin of Rs *(Gonomyia)*. 81
81. Vein R_2 preserved ; antennae black ; a yellow stripe on combined dorsal pleural and lateral tergal areas, and from prothoracic coxae to metapleura ..... ***Gonomyia (I.) cockerelli*** Alex.
— Vein R_2 absent..... 82
82. R_3 present, or 3 veins of Rs reaching margin of wing ; m-cu intersects M_{3+4} about 1/3 length of cell 1st M_2..... ***Gonomyia (Gonomyia) herroni*** Alex.
— R_3 absent, or 2 veins of Rs reaching wing margin..... 83
83. Inner gonostylus expanded and serrate at tip..... ***Gonomyia (L.) capnitis*** Alex.
— Inner gonostylus not expanded or serrate before pointed tip ..... ***Gonomyia (L.) novocaledoniae*** Alex.
84. Wings with element M_{1+2+3} present ; cells as well as veins with scattering of macrotrichia ..... ***Amphineurus (A.) koghiensis*** n. sp.
— Wings without element M_{1+2+3} ; no macrotrichia in cells of wings *(Erioptera)* 85
85. Three terminal antennal segments smaller than other flagellar segments ; no scales on legs ..... ***Erioptera (T.) pilipes*** (F.)
— Antennae not as above, all terminal segments similar ; scales on legs 86
86. Pleura yellow ; outer gonostylus with many teeth at apex..... ***Erioptera (C.) caledonia*** Alex.
— Pleura with 2-3 whitish yellow stripes ; m-cu nearly its own length before fork of M..... ***Erioptera (M.) rhaphidostyla*** Alex.

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Source : MNHN, Paris

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